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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 9 1945

THE EFFECTS OF PROTEIN DIET ON INFECTIVE HEPATITIS

BY

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The effects of diet on the course of various forms of jaundice have been the subject of some controversy. The purpose of this paper is to report on a series of 61 cases of infective hepatitis in men, 32 of which were treated with a high-protein diet with superadded vitamin B complex, and 29 by a classical low-fat diet in which the protein was not augmented.

Definition of Cases

Past experience of infective hepatitis has made it clear that the severity and the duration of the disease are extremely variable (Stocks, 1944; Higgins *et al.*, 1945). Recent claims have been made that the causal organism of infective hepatitis and N.A.B. and homologous serum jaundice are either similar or closely related. The fact that those diseases differ in their clinical course is best shown in Table I. The present series of 61 cases of infective hepatitis are compared with 54 cases of homologous serum jaundice resulting from the same icterogenic yellow fever vaccine. These have been arranged into four groups, depending upon the duration of the illness as originally suggested by Fox *et al.* (1942). The number of cases in each group has been expressed as a percentage of the total in each series.

TABLE I.—*Comparison with Serum Jaundice due to Yellow Fever Vaccine*

	Serum Y.F. Jaundice		Infective Hepatitis
	Fox *et al.*	Personal Series	
Days under treatment:	%	%	%
A: 21 or less	25	19	8
B: 22–49	40	39	86
C: 50–89	23	27	5
D: 89 or over and fatal cases	12	15	0
Cases in each series	759	54	61

It appears from the table that the majority of patients with infective hepatitis fall into Group B, whereas those of serum jaundice are spread over a longer period. This would suggest that the recovery rate of serum jaundice is of a scattered nature; in some the disease is transient, in others there is a greater tendency to relapse (10%). On the other hand, infective hepatitis appears to be largely self-limiting and recovery spontaneous.

In selecting cases for this experiment, therefore, the importance is stressed of using only those patients who gave a history of contact or in whom there was adequate epidemiological evidence of the disease. All cases which had been under arsenotherapy or had had yellow fever vaccine of an unknown batch number, or had had transfusions within 200 days of onset, were excluded. Five W.A.A.F. personnel were also treated under similar conditions, but, owing to paucity of numbers and possible sex differences in the rate of return to normal, these have not been included.

To exclude cases of Weil's disease a leucocyte count was made on entry, and in no case was a total of over 10,000 per c.mm. found. Infective mononucleosis was ruled out by differential counts and by the classical Paul-Bunnell reaction on selected cases. Only those who contracted the disease between Nov., 1943, and May, 1944, have been included in this series.

Criteria of Progress

During the course of treatment to assess progress four criteria were observed. (These were all based on the time taken to return to normal after admission to hospital.)

The first—the presence daily of bile in the urine—was tested by the iodine and foam test. The second—the excess of bilirubin in the serum—was assessed by the quantitative van den Bergh reaction as described by Harrison (1937), using the Lovibond disk. Normal was taken as being less than 0.6 mg. per 100 c.cm.; this test was made every fifth day initially, but later was carried out when the clinical signs suggested the icterus was minimal. The third criterion was the degree of parenchymatous liver degeneration as determined by the intravenous hippuric acid test of Quick (1939). The analysis of the urine, however, was carried out by the method of Weichselbaum and Probstein (1939). Two-hourly samples were used throughout, as these were considered to be more exact and sensitive. The fourth criterion was the time taken to return to duty.

Conditions of Experiment

It was decided to try the effects of foodstuffs readily available, supplementing these with vitamin B complex in the form of bakers' yeast. Two diets were arranged; the first, based on those of Patek and Post (1941) and Fleming and Snell (1942), contained 370 g. carbohydrate, 154 g. proteins, and 108 g. fats. Vitamin B complex was given as bakers' yeast, 30 g. daily by mouth. Parenteral liver (2 c.cm. of anahaemin) and thiamine hydrochloride 5 mg. were given twice weekly subcutaneously. Later the original diet was modified to a more fluid character for some patients in the initial stages. The second was a classical low-fat diet—320 g. carbohydrate, 70–90 g. proteins, 60 g. fats—and acted purely as a control. Vitamins were not supplied in excess of those already contained in the diet. Table II gives details of the diets used in the investigation.

Through the courtesy of the commanding officer a 40-bed ward was set aside for the treatment of infective hepatitis. Cases were admitted alternately, without prejudice, to the right and left sides of the ward. Those on the left side received the high-protein and vitamin B diet, and those on the right the control. Officers were accommodated in the side wards and were given the same diets as the airmen. The ward was never completely filled at any one time, so that this method of random allocation to the diet group presented no difficulties.

While in hospital patients were kept in bed until their liver function was found to be normal by the intravenous hippuric acid method. When the urine became bile-free they were allowed to go to a convalescent home, or, in the case of officers, on sick leave. Initially, during the period at a convalescent home those on the high-protein diets were returned to their normal airman's rations (approximately 100 g. of protein a day), and yeast was withheld. Later, the high-protein diet and yeast were continued during the entire treatment. When in the opinion of the medical officer in charge of the

convalescent home evidence of clinical jaundice was minimal, the patient returned to the main hospital and the van den Bergh test was repeated.

TABLE II.—*Details of the Diets*

	Prescription (approximate)		
	High Protein (C., 370 g.; P., 154 g.; F., 108 g.)	Semi-fluid High Protein (C., 230 g.; P., 120 g.; F., 110 g.)	Low Fat (C., 320 g.; P., 70–90 g.; F., 60 g.)
Breakfast	90 g. prunes 30 g. cornflakes 15 g. sugar 180 g. milk 1 egg 60 g. bread 20 g. butter 15 g. sugar in tea 15 g. marmalade	180 g. milk 30 g. cornflakes 15 g. sugar 1 egg 60 g. bread 15 g. marmalade 20 g. butter	30 g. porridge 90 g. fruit 90 g. bread 90 g. marmalade 60 g. milk
9 a.m.	30 g. yeast 150 g. milk 15 g. sugar	30 g. yeast 150 g. milk 15 g. sugar	Lemonade 15 g. sugar
Dinner, 12 midday	90 g. meat 120 g. potatoes 90 g. vegetables 30 g. bread 20 g. butter 120 g. sweet 180 g. milk 15 g. sugar in coffee	90 g. mashed potatoes 15 g. butter 150 g. fish 90 g. vegetable purée 90 g. milk pudding	120 g. fish 120 g. potatoes 120 g. vegetables 90 g. milk pudding or fruit
2 p.m.	30 g. yeast 150 g. milk 15 g. sugar	30 g. yeast 150 g. milk 15 g. sugar	Lemonade 15 g. sugar
Tea, 4 p.m.	60 g. bread 15 g. butter 15 g. jam Green salad	60 g. bread 20 g. butter 15 g. jam	90 g. bread 60 g. jam 60 g. milk 8 g. butter
Supper	120 g. soup 90 g. meat 120 g. potatoes 90 g. vegetables 90 g. stewed fruit	120 g. soup 90 g. minced meat 90 g. mashed potatoes 90 g. vegetable purée 15 g. butter	120 g. soup 90 g. meat 120 g. potatoes 90 g. milk pudding and stewed fruit
9 p.m.	180 g. milk	180 g. milk 15 g. ovaltine 15 g. sugar	180 g. milk 15 g. sugar

Comparison of Home and Oversea Cases

Of the 61 cases concerned in the experiment, 23 (8 of these were air-crew, 7 of whom were officers) had recently returned from North Africa within the prescribed incubation period of 30 days, and can be said to have contracted the disease away from this country. The remaining 38 (7 were air-crew, of whom 4 were officers—1 officer on ground duties was also included) had not left this country. To ensure that the disease of North Africa was no more severe than that contracted here, a comparative test was made. Table III shows the number of cases placed on each diet from home and oversea service. It is clear that precisely the same proportion of these two groups were on the experimental and the control diets.

TABLE III

	Experimental Diet	Control Diet	Total
Home cases	20 (52·6%)	18 (47·4%)	38
Oversea cases	12 (52·2%)	11 (47·8%)	23

This allows a comparison to be made (Table IV) between home and oversea cases without the possible effects of diet interfering. In order that these results should be comparable with those of other observers, the cases have been further subdivided. Those coming under treatment in hospital within one week of the initial symptoms are designated "early" and after this time "late."

TABLE IV.—*Comparison of Home and Oversea Cases. Mean Duration before Return to Normal in Days*

	Late Cases		Early Cases		Total Cases	
	Home	Oversea	Home	Oversea	Home	Oversea
Biliuria	15·0 (9)	12·4 (8)	11·4 (29)	11·8 (15)	12·3 (38)	12·0 (23)
Van den Bergh	26·6 (9)	20·4 (8)	24·3 (29)	24·4 (14)	24·8 (38)	22·9 (22)
Hippuric acid	16·3 (9)	11·6 (7)	12·8 (28)	12·5 (15)	13·6 (37)	12·2 (22)
Duration of treatment	34·0 (9)	25·8 (8)	32·0 (29)	30·5 (15)	32·5 (38)	28·8 (23)

The number of observations upon which the mean is based appears in brackets.

No significant difference is seen in the duration of any of the standards of fitness from either home or oversea sources. It is therefore considered that the origin of the disease has no bearing on the effects of diets, and, in any case, since those on either diet include equal proportions of home and oversea cases, there can be no error from this source.

The comparative figures for the diet groups are given in Table V.

TABLE V.—*Comparison of Diet Groups. Mean Duration and Standard Deviations in Days*

	Late Cases		Early Cases		All Cases	
	H.P. Diet	Control	H.P. Diet	Control	H.P. Diet	Control
Biliuria:						
Number of cases	10	7	22	22	32	29
Mean duration	13·0	14·9	12·5	10·6	12·6	11·7
S.D.			5·4	4·0	5·2	7·9
Van den Bergh:						
Number of cases	10	7	22	21	32	28
Mean duration	24·1	23·0	24·7	23·9	24·5	23·6
S.D.			9·1	10·2	8·0	12·7
Hippuric acid:						
Number of cases	10	6*	22	21	32	27
Mean duration	10·7	20·2	13·8	11·5	12·8	13·4
S.D.			7·1	9·6	6·8	15·7
Duration of treatment:						
Number of cases	10	7	22	22	32	29
Mean duration	28·0	33·1	33·1	29·9	31·5	30·7
S.D.			12·6	8·4	11·0	12·2

Owing to the small number of cases occurring in the late series the standard deviation has been omitted.

* This figure includes 1 case in which the liver function was subnormal throughout hospitalization.

From Table V it is seen that cases coming under treatment late are small in number and unevenly divided, whereas those coming under treatment early are equally divided. In comparing results there does not appear to be any difference between late and early groups. This is surprising, but may be explained by the fact that only those patients who did not show any immediate response to treatment were transferred from their station sick quarters. These cases tended to be more severe than those in the early series.

Two cases placed on the high-protein diet relapsed. These were both air-crew, and both came under treatment early. The first case—No. 20—relapsed while at the convalescent home. Biliuria was absent and a normal liver function test was obtained before entry to the convalescent home. This patient's second period of biliuria and liver failure has not been included. The second case—No. 8—was discharged from hospital bile-free, the van den Bergh was within normal limits, and the liver function test was normal on discharge. Relapse occurred 11 days later. The second period of hospitalization of this case has not been included, as the object of the experiment is to test the time taken to return to duty.

Case 6, coming late under treatment in the control series, had a prolonged course. Biliuria persisted for 80 days, and the liver function test was still subnormal on discharge.

With so small an experience no significance can be attached to these few individual reactions. In general the evidence given by Table V is that there was no material difference at all between the two diet groups in any of the four characteristics measured.

Discussion

It is possible that the total numbers of cases may be considered to be too small for conclusions to be drawn from these experiments; but it was felt that, since the epidemic period occurs largely during the winter months, care must be taken to include only those from any one winter period, in case of yearly variations in the severity or alterations in the type of the disease.

The importance of even distribution has been recognized in allotting the diet, and statistical analysis has been undertaken to ensure that the use of cases from different areas of infection has not influenced the experiment. It would appear that disease of North Africa in no way differs from that in this country. As Clifford Wilson (1945) has recently stated, the patient's stay in hospital is bound up with many problems

other than their illness; for this reason other criteria have been taken to assess their progress.

The benefit of protein in this disease has largely been based upon the effects of diet in nutritional liver disorders. In the present series it is of interest to note that those on the experimental diet did not show any improvement over those in the control series. This is in striking contrast to the claims made by Beattie (1943–4), who has stated that with hepatitis it was possible to reduce the time spent in hospital by as much as 37% by dietetic measures alone. He further states that, roughly, the average stay in hospital is inversely proportional to the daily intake of protein. It is not clear to which type of hepatitis he refers, nor how much protein is given, but he quotes an average of 150 g. of protein a day in one series—the figure used here.

The active principle in preventing nutritional liver disorders has been traced to sulphur-containing amino-acids, of which methionine appears to be the foremost. It is not possible to determine the methionine content of the diets used in our series, but it is interesting to observe that Wilson *et al.* (1945) and Higgins *et al.* (1945), using oral methionine, were unable to find any statistical difference, using comparable criteria to assess progress.

Macrae *et al.* (1943) have demonstrated that the protein intake of the R.A.F. has exceeded the generally accepted standards of protein requirements. Whether the self-limitation of the disease as shown in Table I is due to the probable protein stores can only be a matter of conjecture. Himsworth and Glynn (1945) have pointed out that the case-mortality rate of the disease of allied pathology—post-inoculation jaundice—was 2.5% in the cases of Fox *et al.* (1942), whereas that in the cases of Findlay *et al.* (1944) it was 1.5%, the difference being considered to be due to the relatively poor nutrition of Fox's cases. This may suggest that the effect of protein is maximal as a protective but not as a restorative measure, and that, as protein deficiency is not found in the R.A.F., this may be the reason for the similarity of the two series. It is clear, however, that no harm arises as the result of the increased protein, and, in the meantime, a further experiment on similar lines is being undertaken with widely divergent protein intakes.

Summary

The progress of 61 cases of infective hepatitis in the R.A.F. is assessed; 32 were treated with high-protein diet with added vitamin B complex and liver extract; 29 were on a control diet. No response to this form of therapy is noted. Two cases relapsed following the high-protein vitamin B diet.

The recovery rate of a series of cases of jaundice due to icterogenic yellow fever vaccine is compared with a series of cases of infective hepatitis.

No difference has been found between the course of cases from North Africa and those from this country.

My thanks are due to Air Vice-Marshal Sir Harold Whittingham, K.C.B., for allowing me to publish this paper; to Dr. A. Bradford Hill (Consultant in Medical Statistics to the R.A.F.) for advice on the statistical analysis; to Group Capt. J. G. Russell and Group Capt. G. A. M. Knight, commanding officers of an R.A.F. hospital, for setting aside a ward for the treatment of these cases; to Wing Cmdrs. T. Macrae, O.B.E., and C. Hardwick, and Squad. Ldr. S. Yudkin, for criticism and advice; to Fl. Officer D. M. Forgan for supervision and preparation of the diets; to Sisters MacLeod and Fleet, of P.M.R.A.F.N.S., for the careful way in which the patients were supervised; and to the laboratory staff, who have met the extra work with zeal and enthusiasm.

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CIVILIAN DYSPEPSIA

BY

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Service reports leave no doubt that dyspepsia is an important medical problem of the war, and the purpose of this paper is to show that the same problem exists at home. The present series of cases covers two years—1943 and 1944—at a hospital which serves a large industrial and poor residential district in Greater London. All patients with dyspepsia were referred to the special dietetic out-patient department or to the dietetic wards under our care. Both the surgical and the medical complications of peptic ulcer were admitted to our department, and therefore a satisfactory perspective of the peptic ulcer problem was obtained. A small number of ulcer patients remained in other wards but were fed from the diet kitchen and have been added to our series; probably 98% of dyspepsia cases attending the hospital are included in our figures. The dietetic department has been working eight years, and therefore the figures represent an equilibrium which has been established with the district. A detailed history and examination were recorded in all patients, and are available for further analysis. Barium meal examinations were made in nearly every case, and gastroscopy was freely used in trying to achieve an accurate diagnosis. The clinical material is summarized in Table I. The series does not include about 200 patients referred from other hospitals for gastroscopy.

"X-ray negative" Dyspepsia

Of all new patients with gastric symptoms 59% have a peptic ulcer. The large group of non-ulcer dyspepsias (41%) will be the subject of a later report, and only a brief account of them will be given. First there was a small group of patients with obvious air-swallowing or nervous vomiting. Secondly, various physical causes may be finally diagnosed—e.g., chronic gastritis, gall-bladder disease, carcinoma ventriculi, early congestive heart failure, pulmonary tuberculosis, diaphragmatic hernia, or habitual purgation. In the majority of cases no definite diagnosis could be given, and they include all degrees of dyspepsia from slight occasional discomfort to regular remittent dyspepsia. At least half this group gave histories suggesting peptic ulcer, and sometimes a subacute gastric ulcer was found gastroscopically. We believe they are indeed peptic ulcer subjects, and correspond with the many patients with proved ulcers (especially duodenal) who give a history of having had a previous negative barium meal examination. Many of these dyspepsia cases seem to arise from the same factors that favour peptic ulcer—the rush and hurry of modern life, with its fatigue, worries, irregular meals, and nervous tension. Modern civilization provides good opportunities for the energetic and conscientious constantly to irritate their stomach. The intensity and duration of the stimuli may determine whether there is only irritability of the stomach or duodenum or a peptic ulcer is in process of formation.

It is worth noting that, although gall-bladder disease was constantly being looked for and many negative cholecystograms were being obtained, in only 23 (5 males and 18 females) out of 1,522 patients was there good evidence of cholecystitis or cholelithiasis; and as a cause of women coming to hospital with dyspepsia, duodenal ulcer (91 cases) was five times as common as gall-bladder diseases. These figures do not include the patients admitted to other wards with biliary colic or jaundice, but, even so, during 1944 the Medical Research Council Classification of Diseases Register (in-patients only) showed only 34, 20, and 4 admissions for the groups 545 (cholecystitis), 546 (cholelithiasis), and 547 (other gall-bladder diseases) respectively.

TABLE I.—*Summary of Clinical Material at the Central Middlesex County Hospital from Jan. 1, 1943, to Dec. 31, 1944*

In-patient admissions (general medical and surgical)	15,836		Excludes 2,582 mothers and 2,631 babies in the maternity department	
New patients attending consulting out-patient department (general medical and surgical)	16,074		Excludes ante- and post-natal, dental, electrical, *x*-ray, casualty, and V.D. departments. Many were probably admitted and are included in the first group	
New patients with gastric symptoms attending dietetic clinic as in-patient or out-patient, or both (but not counted twice)	1,522	G.U., 271 (F., 79) D.U., 681 (F., 91) Post-operative dyspepsias, 33 "*X*-ray-negative," 342 "*X*-ray-negative" haematemesis, 57 Duodenitis, 25 Pylorospasm, 28 Gall-bladder diseases, 23 Carcinoma ventriculi, 44 Gastritis, 21	The gastric ulcers include 42 acute gastric ulcers diagnosed gastroscopically and probably not visible radiologically. 58 "pyloric or juxtapyloric" ulcers are included with the duodenal ulcers	Gastric/duodenal ulcer ratio 1 : 2·5
Admissions with frank haematemesis and/or melaena	220	G.U., 56 (F., 23) D.U., 67 (F., 14) Post-operative, 15 (F., 3) "*X*-ray-negative," 57 Miscellaneous, 25	The gastric ulcers include 15 ulcers demonstrated gastroscopically but not visible when *x*-rayed during convalescence	Gastric/duodenal ulcer ratio 1 : 1·2
Admissions with perforations	90	G.U., 11 (F., 1) D.U., 77 (F., 7) Jejunal ulcer, 2		Gastric/duodenal ulcer ratio 1 : 7
Deaths attributable to peptic ulcer	27	G.U., 15 D.U., 11 J.U., 1	Haemorrhage, 11 deaths Perforation, 10 deaths (3 not operated on) After elective surgery for peptic ulcer, 6 deaths (116 partial gastrectomies and 16 gastro-enterostomies)	Gastric/duodenal ulcer ratio 1 : 0·73

Peptic ulcer was diagnosed in 952 patients.

TABLE II.—*Peptic Ulcer Cases*

	M.	F.	Total	F./M. Ratio
Acute gastric ulcer (gastroscopic) ..	21	21	42	1 : 1
Chronic gastric ulcer (lesser curvature or adjacent anterior or posterior walls)	171	58	229	1 : 3
Pyloric ulcer	46	12	58	1 : 4
Duodenal ulcer	544	79	623	1 : 6
Total	782	170	952	1 : 4·7

Age and Sex Incidence

The accompanying Chart shows the maximum incidence for gastric ulcer between 40 and 60, but duodenal ulcer has an earlier peak at 35 to 39. The pyloric ulcer curve corresponds more closely with the gastric ulcer than with the duodenal ulcer curve, but a possible fallacy may be that scarring from long-standing duodenal ulcer may cause deformity of the pyloric canal.

Apart from the rapidly healing acute ulcers, in which the sex ratio is equal, there is a big preponderance of men, and it is interesting to note the different sex ratios. As duodenal ulcer has a different sex and age incidence from gastric ulcer it is possible that different factors are involved in their causation. There are big variations in the proportion of gastric and duodenal ulcer in various series from different parts of the country and from different sections of the community. If there are varying aetiological factors between gastric and duodenal ulcer a clue might be found where there are significant differences.

Relative Incidence of Gastric and Duodenal Ulcer

There are six possible fallacies in comparing published figures. First, the civilian series refer without exception to patients admitted to hospital or nursing homes. It is fair to say there is a bias towards admitting gastric rather than duodenal ulcer cases because a large lesser-curve ulcer is more impressive than a deformed duodenal cap, and the patient often looks more ill. Further, there may be a suspicion of malignancy with a gastric ulcer. One of us (F. A. J.), working at St. Bartholomew's Hospital before the war, can confirm the operation of the bias. The pressure on beds did not allow uncomplicated ulcers to be admitted, and the majority of duodenal ulcer patients were returned to their doctor after the *x*-ray diagnosis had been established. In 1936 the G.U./D.U. ratio of in-patients was 1 : 0.79, but an examination of the *x*-ray department reports in the same year showed a G.U./D.U. ratio of 1 : 2.2. Secondly, it is necessary to know how often pyloric or pre-pyloric ulcers are diagnosed and whether they are included with the gastric or the duodenal ulcers. There is good reason for following Illingworth *et al.* (1944) and including them with the duodenal ulcers, for at operation it may be very difficult to decide whether the ulcer is pyloric or duodenal, and it is our experience that the radiological diagnosis of pyloric ulcer is not always confirmed at operation and the ulcer may be duodenal;

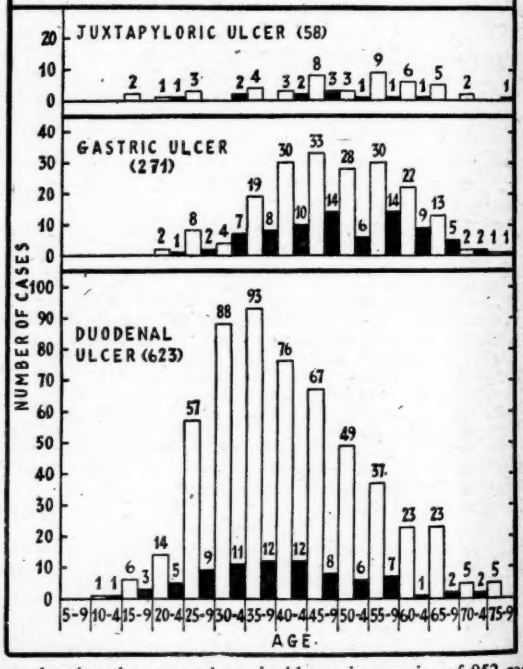
AGE INCIDENCE: MALE □; FEMALE ■
JUXTAPYLORIC ULCER (58)
GASTRIC ULCER (271)
DUODENAL ULCER (623)
NUMBER OF CASES
AGE
5-9 10-4 15-9 20-4 25-9 30-4 35-9 40-4 45-9 50-4 55-9 60-4 65-9 70-4 75-9

Chart showing the age and sex incidence in a series of 952 cases of peptic ulcer.

and, further, a pre-pyloric ulcer is extremely rare gastroscopically. Thirdly, it is fallacious to argue from the proportion of ulcers which bleed, perforate, or cause death, as can be seen by the variation in ratios in this series of consecutive cases attending one hospital (Table I). Fourthly, the social status is apparently significant, for death-rate studies show that

at under 65 gastric ulcer is more lethal in the poor and that duodenal ulcer causes more deaths in the wealthy than in the poor (Morris and Titmuss, 1944). Fifthly, the age incidence of different series is most important, because the age peak for duodenal ulcer is apparently earlier than for gastric ulcer (see Chart). Taking only males under 45, the G.U./D.U. ratio changes from 1 : 2.5 for the whole series to 1 : 5.5 ! The sixth fallacy may be the inclusion of " *x*-ray-negative " gastric ulcers diagnosed gastroscopically. In many of the previous series gastroscopy has not been performed, and the exclusion of such cases from our series would alter the G.U./D.U. ratio from 1 : 2.5 to 1 : 3.0.

Taking these points into consideration, it may be profitable to review the figures given for London, elsewhere in the country, from the Services, and for private patients.

TABLE III.—*London Series*

Source	No.	Year	G.U./D.U. Ratio
Registrar-General (Tidy, 1944)	—	1921	1 : 0.3 6
	—	1928	1 : 0·42
Admissions to L.C.C. Hospitals (Daley, 1942)	15,443	1933–8	1 : 0·62
In-patients at London Hospital (Souttar, 1927)	1,275	1923–5	1 : 1·0
Admissions to St. Thomas's Hospital (Tidy, 1944)	870	1926–7	1 : 0·66
	986	1930–3	1 : 0·45
	862	1934–7	1 : 0·40
Admissions to St. Bart's	335	1936	1 : 0·79
Sample of *X*-ray dept.'s barium meal reports at St. Bart's	80	1936	1 : 2·2
The present series	952	1943–4	1 : 2·5

Our conclusion that duodenal ulcer is 2½ times as common as gastric ulcer is the complete reversal of previous series, and we believe the difference is due to the inclusion of out-patients in our series. This view is supported by the difference between the G.U./D.U. ratio at St. Bartholomew's Hospital in 1936 for in-patients (1 : 0.79) and the *x*-ray department figures for in-patients and out-patients (1 : 2.2)—suggesting that the majority of duodenal ulcer cases were not admitted to the wards. The Registrar-General's ratio is probably fallacious, for a chronic gastric ulcer is more lethal than a duodenal ulcer should bleeding or perforation occur.

TABLE IV.—*Service Series*

	No. with Dyspepsia	G.U./D.U. Ratio*	% Ulcer	
Army:				
Morris (1940)	500	1 : 8·7	42·8	D.U. include 10%† juxtapyloric ulcers
Brockbank (1942)	931	1 : 6·5	41·5	D.U. include 6·3%† juxtapyloric ulcers
Spillane (1941)	200	1 : 4·5	32	No mention of pyloric ulcers
Graham and Kerr (1941)	246	1 : 5·9	64	" "
Hill (1943)	197	1 : 4·7	34·6	D.U. include 4·5%† pyloric ulcers
Tidy (1941)	2,500	1 : 4·4	51·9	D.U. include 8% pyloric ulcers
Hinds Howell (1942)	1,422	1 : 4·6	51	D.U. include 5%† pyloric ulcers
Payne and Newman (1940)	287	1 : 4·2	78	No mention of pyloric ulcer
Navy:				
Wade (1942)	1,063	1 : 6·0	45	" "
Allison and Thomas (1941)	100	1 : 5·7	45	
R.A.F.:				
Rook (1943)	194	1 : 4·0		
Present series (1943–4):				
Males under 45	610	1 : 5·5	66	

* Where possible, calculated to include pyloric ulcers with duodenal ulcers.
† These percentages refer to the total series.

Where possible, the figures given include the pyloric ulcers with the duodenal ulcers; this can be a significant factor, for if included with the gastric ulcers Hinds Howell's series gives a ratio of 1 : 2.5 instead of 1 : 4.6. The overwhelming preponderance of duodenal ulcer is seen in all the series, and it seems to correspond to the ratio 1 : 5.5 obtained from our civilian series by taking only males under 45.

Nicol (1941) suggests there may be significant variations in different parts of the country, and gives the following figures:

TABLE V.—*Geographical Variations*

	G.U./D.U. Ratio		G.U./D.U. Ratio
Glasgow (Young, 1927)	1 : 6·4	Leeds (Flint, 1927)	1 : 2·8
Aberdeen (Nicol, 1941)	1 : 6·8	London (Souttar, 1927)	1 : 1·0
Edinburgh (Wilkie, 1927)	1 : 6·1		

Nicol doubted the validity of the London figure, and his suggestion that more duodenal ulcers are treated at home seems to be correct, but there is still a gross discrepancy with the Scottish figures. Whether this may be due to an absolute increase in duodenal ulcer or whether gastric ulcers are less frequent in Aberdeen remains to be studied. Table VI gives available figures for private cases.

TABLE VI.—*Private Cases*

	No.	G.U./D.U. Ratio
Aberdeen (Nicol, 1941)	229	1 : 4·5
London (Ryle, 1932)	261	1 : 4·0
New Lodge Clinic, London (Barford, 1928)	166	1 : 4·3

There is probably little selection with private cases, for all who are seen in consulting-rooms or nursing homes are likely to be included. Even if the pyloric ulcers are included with the gastric ulcers there is a greater incidence of duodenal ulcer than in our own series, and duodenal ulcer may be more common in private than in hospital practice.

Ratio of Fatal Cases to New Patients

During the two years 1943–4 there were 1,522 new patients with gastric symptoms; 952 of these had proved peptic ulcer, and 27 died from peptic ulcer—i.e., there were 35 new patients for every death from ulcer. The ratio is open to criticism, but the possible fallacies may in part cancel themselves. The number of ulcer cases does not take into account the patients diagnosed as " *x*-ray-negative " dyspepsias with an ulcer-like history, and it does not include the " *x*-ray-negative " haematemesis and melaena or patients with pylorospasm. The majority of such patients are probably candidates for peptic ulcer if ulcers are not already present.

Our numbers are too small to allow more than a rough calculation, but they help to provide an estimate for the ulcer population in England and Wales. First, between 1929 and 1938 there were 43,200 deaths from peptic ulcer, and therefore 43,200×35=1,512,000 people may have developed ulcers during that time. Secondly, comparing the age incidence of our new patients and our deaths, and applying the ratio in each age group to the national figures, an estimate can be made of the number of ulcers beginning in one year (Table VII).

TABLE VII.—*Estimate of Number of Ulcers beginning in One Year (Males only)*

Age Group	Cases	Deaths	Ratio	National Deaths (1938)	National Cases
−15	1	0	—	0	0
15–25	25	0	160 ×	54 =	9,000*
25–35	160	1	160 ×	170 =	27,000
35–45	225	1	225 ×	488 =	110,000
45–55	188	10	19 ×	882 =	17,000
55–65	127	5	25 ×	1,063 =	26,000
65–75	50	4	12 ×	644 =	8,000
75+	6	1	6 ×	251 =	1,500
Total	782	22		3,552	198,500

* Assumed age 25–35 ratio.

This would suggest that nearly 200,000 men develop peptic ulcer each year. The mortality of patients treated in a specialized gastro-intestinal clinic is likely to be lower than in the country as a whole. This may be offset by the probability that most gravely ill patients are sent to hospital, whereas many with mild peptic ulcer symptoms are treated by their doctor and not referred to us.

Thirdly, the post-mortem incidence of active or healed ulcer in the stomach or duodenum has been given as 10.25% of all necropsies in a general hospital (Hurst and Stewart, 1929).

Mr. R. M. Titmuss has kindly assisted us with these calculations, and considers we are justified in giving a rough estimate that the number of living people in England and Wales who have suffered from peptic ulcer is around 1,500,000 and may even be higher. We do not wish to stress these figures except to indicate that peptic ulcer seems to be an appreciable problem in this country.

Peptic Ulcer: A Modern Industrial Problem

Unfortunately many cases of peptic ulcer relapse, and the majority of those who have had ulcers have to follow simple rules to avoid further symptoms—e.g., regular meals with balanced diet, avoidance of common indigestible foods, avoidance of undue fatigue, and maintenance of a calm philosophical outlook on life. It is a problem which mainly confronts men during their working life and often when at their prime. Although peptic ulcer does not cause heavy loss of life (little more than 1% of non-violent deaths) it results in much suffering and incapacity for work. The ulcer subject has "guts" even if they are weak ones, and he does not give in easily. The man with a duodenal ulcer is usually of special value to industry, for he is over-conscientious, with plenty of drive and a sense of good standards of work.

The magnitude of the problem demands further study of those factors in modern industrial life which favour peptic ulcer.

Summary

An analysis in given of all patients with digestive trouble coming to a large general hospital in Greater London. Of 1,522 patients, 952 were found to have peptic ulcer.

The ratio of women to men with peptic ulcer was 1: 4.7.

The ratio of gastric to duodenal ulcer was 1: 2.5. This is higher than in previous London series.

The ratios of previous series are considered and possible causes for discrepancies discussed. An important factor is the exclusion of out-patients in most series, for patients with duodenal ulcer probably have less chance of hospital admission than those with gastric ulcer.

The ratio of gastric and duodenal ulcer in Service series is found to be equivalent to the figure for males under 45 in the present civilian series.

Calculations suggest there are about 1,500,000 living people in England and Wales who have suffered from peptic ulcer.

Thanks are due to Miss C. F. Harris, our dietitian, who has kept a careful record of all in-patient and out-patient diagnoses. We are also grateful to Mr. R. M. Titmuss for statistical advice.

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Increased standard rates of pay and improved conditions of service for mental nurses in Scotland are among the recommendations by the Scottish Nurses' Salaries Committee to the Secretary of State, who commends them for adoption by hospitals in a circular issued by the Department of Health for Scotland. The Taylor Committee has been dealing during the last three years with nurses' salaries and has still to submit its complete report, but puts forward to the Secretary of State a summary of the points on which agreement has been reached up to date. The present recommendations will apply from April 1, 1945. The scales awarded are broadly similar to those recommended last year by the Rushcliffe Committee for mental nurses in England and Wales.

NUTRITIONAL MACROCYTIC ANAEMIA AND THE ANIMAL PROTEIN OF DIET

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The incidence of anaemia, especially of nutritional macrocytic anaemia, in relation to the animal protein content of the diet is of interest in countries such as India, where most of the population live on barely adequate or frankly inadequate diets. During war and post-war periods, when nutritional anaemias are probably more widespread, the subject becomes of world-wide importance.

The study of the incidence, type, and severity of cases of anaemia in relation to the diets of a population affords some evidence of the inadequacy of such diets. This note is based on 50 consecutive unselected cases of anaemia seen between May 1 and Sept. 15, 1944, studied from this point of view. They occurred among a population of adult male Indians (17,000 meat-eaters and 1,188 vegetarians), all the sick of which were admitted into one hospital. The men had been on known rations for over two years. The men and their quarters were medically inspected regularly. The locality was a desert and the climate was extremely hot in summer. The hospital admission rate was the low one of 1.5 per 1,000 per day. There was practically no fresh malaria and the dysentery rate was very low. All cases with red blood counts of under four million cells per c.mm. or corresponding haemoglobin of under 11.6 g. were investigated, with the exception of cases admitted for obvious pulmonary tuberculosis. This arbitrary standard was adopted to exclude borderline cases.

The following normal ranges for absolute values, suggested for general use in India by Napier and Das Gupta (1942), were adopted for analysis of this series: mean corpuscular haemoglobin (M.C.H.) of 24 to 33 micromicrograms ($\gamma\gamma$), mean corpuscular haemoglobin concentration (M.C.H.C.) of 30 to 35%, and mean corpuscular volume (M.C.V.) of 80 to 100 cubic microns (c.μ).

Examinations were carried out on oxalated venous blood. The standardized Sahli haemoglobinometer was used. Stool and urine examinations, test-meal, sedimentation rate, Kahn test, and skiagrams of the chest were carried out, in addition to a full clinical examination, in all cases. The first blood examination figures, after admission, and the results of other investigations, are shown in Table I.

All 50 cases, except one, had complicating factors (Table II). An analysis of the 50 cases according to age, occupation, race, and living conditions failed to bring out any differences; but it was found that 27 of them were lifelong vegetarians, 2 were temporary vegetarians, and 21 meat-eaters. The vegetarians had never taken meat or eggs. The vegetarians and meat-eaters were fed from the same kitchens. They were equally exposed to malaria, hookworm, and other diseases. No difference in general body development was seen in the two groups. The two temporary vegetarians suffered from dyspepsia and undulant fever. The dyspeptic patient had omitted meat from his diet for six months. The undulant fever case had lived on a hospital milk diet without meat or eggs for two months.

It was possible to check with some accuracy what was eaten. The daily rations were: 18 oz. of atta (wheat flour) or rice, 2½ oz. of dhal (pulses), 3¼ oz. of ghee (clarified butter or vegetable oil), 2/3 oz. of condiments, 2 oz. of onions, 2 oz. of potatoes, 4 oz. of fresh vegetables, and 6 oz. of fresh mutton with bone, for five days in a week. Leafy vegetables were issued for only a few months of the year. The vitamin A content of the diet was also known to be low. In lieu of fresh meat vegetarians were allowed 4½ oz. of tinned milk three days a week, and 3/4 oz. of ghee and 3 oz. of atta or rice for two days a week. This amounted in practice to one tin of unsweetened milk containing 13 fluid oz., equivalent to 26 oz. of

fresh milk, each week. But of 27 vegetarians with anaemia only 11 had received milk in lieu of meat. No one had bought any extra milk from canteens or elsewhere. The meat ration of 6 oz. of fresh mutton with bone for five days a week amounted to 4 oz. without bone. This was checked in local carcasses. Therefore, 20 oz. of fresh mutton without bone

TABLE I.—*Results of Blood Examination in 50 Cases of Anaemia*

Case No.	R.B.C. (mills.)	Hb (g.)	M.C.H. (γγ)	M.C.H.C. (%)	M.C.V. (c.μ)
Vegetarians:					
3	2·0	7·28	36·4	29·03	125·3
4	3·55	12·6	35·4	28·8	122·8
5	1·25	4·9	31·5	28·6	109·0
6	1·2	4·7	39·1	36·1	108·3
7	4·0	9·05	22·6	24·46	92·2
8	2·8	12·4	44·2	32·6	135·0
9	1·7	6·35	37·3	31·7	117·6
11	1·9	6·69	39·2	30·4	115·8
13	1·8	6·35	35·2	28·8	122·2
16	1·4	5·85	41·7	31·6	132·0
17	2·5	8·3	33·2	31·9	104·0
20	3·2	13·0	41·2	33·3	121·8
22	3·4	6·2	18·2	20·0	91·1
23	3·5	10·5	30·0	32·8	91·4
24	1·08	4·46	41·2	37·1	111·0
25	1·5	5·85	39·0	30·7	126·6
26	3·0	11·7	39·0	36·56	106·6
27	2·4	8·3	34·5	26·7	129·1
32	3·1	9·92	32·0	26·1	122·6
35	3·75	12·6	33·6	28·88	116·2
36	1·8	7·0	38·8	30·5	127·1
39	2·7	12·2	40·5	38·1	118·5
40	3·0	9·9	33·0	30·0	110·0
41	3·7	9·65	26·08	26·08	100·0
43	3·7	13·02	35·1	36·2	114·8
50	4·15	10·3	24·8	21·4	115·5
Temporary vegetarians:					
29	1·8	6·45	35·8	30·7	116·6
14	2·1	6·72	32·0	26·88	119·0
Meat-eaters:					
1	4·2	9·6	22·8	24·0	95·2
2	4·3	9·1	21·1	21·4	98·8
10	3·0	4·96	16·5	21·5	76·6
12	4·2	9·3	22·1	28·4	77·8
15	4·7	8·7	18·5	20·9	88·2
18	4·3	9·3	21·6	24·4	80·8
19	3·8	8·0	21·05	24·2	86·8
21	4·2	9·5	22·6	26·3	85·7
28	3·8	6·8	17·8	21·2	84·2
30	4·3	9·9	23·02	24·7	93·0
31	4·0	7·45	18·6	21·3	92·5
34	4·2	7·95	18·9	22·8	82·8
37	3·8	8·55	22·5	25·3	88·6
38	4·8	9·3	19·3	21·1	91·6
42	5·5	10·5	19·9	22·8	83·63
47	4·9	9·1	18·5	24·5	75·6
49	4·25	10·92	25·6	27·0	94·8
Sprue—vegetarians:					
46	2·1	7·7	36·6	30·8	119·04
Sprue—meat-eaters:					
33	2·0	7·95	39·7	33·1	120·0
44	2·7	9·1	33·7	25·2	133·0
45	1·9	7·0	36·8	30·5	120·4
48	2·0	8·68	43·4	29·4	147·1

weekly was the main difference in the diets of vegetarians and meat-eaters, although 11 vegetarians had been drinking one tin of milk weekly. Excluding milk and meat rations, the diet

TABLE II.—*Complicating Factors*

Disease	Meat-eaters	Vegetarians	Temporary Vegetarians	Sprue
Hookworm	14	12	—	2
Roundworm	—	1	—	—
Tapeworm	—	1	—	—
Malaria	9	14	—	2
Bacillary dysentery	—	9	—	—
Amoebic dysentery	—	1	—	—
Amoebic hepatitis	1	1	—	—
Infective hepatitis	—	1	—	—
Syphilis	—	1	1	—
Active tuberculosis (closed)	1	1	—	—
Suspicious skiagrams of lungs	4	3	—	—
Dyspepsia	—	—	1	—
Undulant fever	—	—	1	—

contained over 3,000 calories and over 80 g. of vegetable protein. The diet is emphasized because the anaemia, in its type and severity, was closely and regularly related to the diet consumed.

Classification

Haematologically, the cases grouped themselves as follows: Normocytic-orthochromic, 2; normocytic-hypochromic, 15; microcytic-hypochromic, 3; macrocytic-hyperchromic, 25; macrocytic-orthochromic, 4; and macrocytic-hypochromic, 1. It was found that (*a*) 17 out of the 20 normo-microcytic group were meat-eaters, and (*b*) 26 out of 30 of the macrocytic group were vegetarians. The remaining 4 were meat-eaters and cases of sprue.

Aetiologically, as a low M.C.H.C. is accepted as indicating iron deficiency, and a high M.C.V. or macrocytosis as usually indicating a haemopoietic-principle (or principles) deficiency, the cases can be classified as: (i) Iron-deficient normo-microcytic cases consisting of 17 meat-eaters and 3 vegetarians. Sixteen were infested with hookworm, three had malaria, and one was a case of idiopathic hypochromic anaemia. (ii) Haemopoietic-principle deficiency macrocytic cases, consisting of 24 cases of nutritional macrocytic anaemia (all vegetarians), 5 cases of sprue, and 1 case associated with undulant fever. Nine of the nutritional macrocytic cases were "dimorphic" (see later). Thus there were two main groups—17 meat-eaters who had iron-deficiency (low M.C.H.C.) hypochromic anaemia, and 24 vegetarians with nutritional macrocytic anaemia. These significant facts are examined later in relation to the numbers of the population from which the cases were admitted.

Before this investigation there was a clinical impression that severe anaemia was associated with vegetarianism in this Indian population. To test this impression the cases were analysed according to severity. Severe anaemia was arbitrarily defined as one with a red cell count of two millions or below, or a haemoglobin of 5.8 g. (which is comparative to this R.B.C. level) or below. It was found that, whereas there was only one case (No. 10) of severe anaemia in the iron-deficiency group of 17 meat-eaters, there were 11 cases of severe anaemia in the 24 vegetarians with nutritional macrocytic anaemia. Three of the five sprue cases had also a severe anaemia. The only severe anaemia seen among the meat-eaters (excluding sprue cases) was not clinically serious. But the majority of the severe cases among the vegetarians were obviously seriously ill on admission to hospital.

Incidence

In view of the contrast in type and severity of anaemia shown by the vegetarian and the meat-eating patients in this series, the incidence was examined according to diet. It was found that in 4½ months 17 cases of anaemia came from the group of 17,000 meat-eaters and 26 from the 1,188 lifelong vegetarians—a rate of 2.6 per 1,000 per year for meat-eaters and 58.5 per 1,000 per year for vegetarians. Anaemia associated with sprue and undulant fever was excluded from the incidence analysis for the reason that the anaemia occurred during the course of another serious illness. The 24 cases of nutritional macrocytic anaemia came from the vegetarians—a rate of 54.1 per 1,000 per year. Not a single case came from the meat-eaters. Of the 20 cases of iron-deficiency anaemia 17 came from the meat-eaters and the remaining 3 from the vegetarians. Nine of the nutritional macrocytic cases also had iron deficiency (low M.C.H.C.), so that the incidence of iron deficiency was 10 times greater in vegetarians than in meat-eaters.

Severe anaemia as already defined occurred at a rate of 24.7 per 1,000 per year in the vegetarian group and 0.16 per 1,000 in the meat-eaters.

It would be of interest to compare these results with the incidence in areas where malaria and dysentery are rife.

Some Clinical and Haematological Features

1. The iron-deficiency group of 20 cases was mainly a mild normocytic-microcytic hypochromic anaemia. The red cell counts in the group varied between 3,000,000 and 5,500,000 (Hb only 10.5 g. in the latter case). The haemoglobin varied between 4.96 and 10.9 g. The 4 cases in this group which were not infested with hookworms were associated with malaria in three instances, and the fourth was an idiopathic hypochromic anaemia.

2. The 30 macrocytic anaemias were classified into 24 cases of nutritional macrocytic anaemia, 5 cases caused by sprue, and 1 case associated with undulant fever. In the 24 nutritional macrocytic cases the blood picture, as shown in Table I, was varied. The lowest red cell count was 1,080,000 and the lowest haemoglobin 4.46 g. Clinically, out of 11 severe cases 7 were seriously ill and were confined to bed. Others, though suffering from advanced anaemia, had few complaints. It was of

interest to note that men with red cell counts below two millions were doing full duties before admission. Though every one of these 24 cases had a complicating factor, which was irregularly distributed, the incidence of such factors was not higher than in the remaining 26 cases, except that bacillary dysentery or its history was present in 9 cases and not in the anaemia of other groups. But each case occurred in a vegetarian, and, what is more, not a single meat-eater of the 17,000 had developed this type of anaemia. Vegetarianism was thus thought to be the principal cause of nutritional macrocytic anaemia in this series. It is not, however, the purpose of this note to discuss what is present in the meat ration which prevents the occurrence of macrocytic anaemia.

One case showed how quickly a severe nutritional macrocytic anaemia may develop. A champion wrestler—a vegetarian—had had excellent rations, with four extra tins of milk weekly, and plentiful fruit and vegetables, as he lived in a fertile part of the country. He was transferred to the desert, where his ration contained little or no fruit and vegetables, and no milk. After three months of this diet he developed a severe macrocytic anaemia with a red cell count of 1,250,000 and Hb of 4.9 g.

In the 5 cases of sprue anaemia there was nothing of particular note.

The patient with severe undulant fever developed macrocytic anaemia after two months in hospital. In health he was a meat-eater, but in hospital was given a milk diet without eggs. There was no clinical anaemia on admission, but after two months' fever he looked very pale, which led to a full blood investigation, with the following results: R.B.C., 2,100,000; Hb, 6.72 g.; M.C.H., 31.5 $\gamma\gamma$; M.C.H.C., 26.28%; M.C.V., 119.0 c.μ. The sternal marrow differential count showed 7.75% megaloblasts, 14% erythroblasts, 27% macroblasts, and 18% normoblasts. No other anaemia-producing factors were present. The blood picture in this case was of interest because undulant fever usually produces a microcytic anaemia, the macrocytic form being rare. The anaemia usually is not severe. Strong (1942) says: "The lowest recorded count by Basset-Smith was 2,500,000, and by Kern 2,800,000."

3. That 9 of these 24 macrocytic cases had an M.C.H.C. below 30% was of interest. Four were infested with hookworms. Two had achlorhydria, but free acid returned as anaemia disappeared. In the remaining three the iron deficiency appeared to be purely dietetic in origin. These 9 cases were similar to the "dimorphic" group recently emphasized by Trowell.

4. Koilonychia occurred in 7 cases (Table III). There was a low M.C.H.C. in all except one. Five cases had hookworm infestation. In one of these there was achlorhydria. The case with a normal M.C.H.C. (30.5%) had an M.C.V. of 127 c.μ.

5. Test meals gave the following abnormal results. Achlorhydria was present in 7 nutritional macrocytic anaemias and 5 iron-deficiency anaemias on the first examination. Acid was later found in four of the former group and two of the latter. Histamine was not available.

6. The results of the examination of the lips, buccal mucous membrane, tongue, and eyes have been tabulated. Cheilitis and angular stomatitis were common, but exact records were not kept in the earlier cases. Sublingual glossitis was a condition in which the under surface and sides of the tongue were very red and tender, and, in some, large red papules were present.

TABLE III.—*Findings in Mouth, Eyes, and Nails*

Disease	Meat-eaters	Vegetarians	Temporary Vegetarians	Sprue
Generalized glossitis	—	8	—	5
Geographical tongue	2	4	—	—
Sublingual glossitis	4	4	—	—
Enlarged numerous fungiform papillae	11	16	—	2
Koilonychia	5	2	—	—
Bitot's spots (xerophthalmia) ..	—	2	—	—

Conclusions

A full blood investigation of 50 consecutive cases of anaemia in Indian men in an extreme desert climate, where there was a low sickness rate (about 1.5 per 1,000 per day), showed that the admission rate to hospital for anaemia per 1,000 of population among vegetarians was 22 times greater than among meat-eaters. The incidence of severe anaemia was very much greater in vegetarians than in meat-eaters in this series.

The anaemia differed in type and severity in the two groups, being mainly macrocytic in the vegetarians (nutritional or tropical macrocytic anaemia) and hypochromic and either normocytic or slightly microcytic in the meat-eating group. No case of nutritional macrocytic anaemia was seen in a meat-eater.

In all cases except one a complicating factor was found, hookworm and malaria being most frequent.

The difference in the habits of the two groups, which were otherwise alike, was that social customs prevented the vegetarian group from eating the weekly ration of 20 oz. of fresh mutton in the meat-eaters' ration. The absence of this meat appeared to be the cause of macrocytosis and severity and frequency of anaemia in the vegetarian group. The rations contained over 3,000 calories and over 80 g. of vegetable protein. Riboflavin and vitamin A were known to be low.

It will be of interest to compare these results with findings when the stress of severe frequent malarial infection and dysentery is great.

One case showed that a severe macrocytic anaemia may develop within three months if milk, fresh fruit, and vegetables are much reduced in a vegetarian diet. Another case in which severe macrocytic anaemia developed during a prolonged fever (undulant fever) showed the need of liver and iron in the diet in cases of chronic illness.

Summary

The incidence, type, and severity of anaemia in an Indian adult male population of about 18,000 were shown to depend on the meat content of the diet. Nutritional macrocytic anaemia occurred only in vegetarians in a series of 50 cases.

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THE DIAGNOSIS OF DOUBTFULLY PENETRATING ABDOMINAL WOUNDS

A LESSER OPERATIVE PROCEDURE

BY

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A diagnostic procedure for doubtfully penetrating abdominal wounds, introduced by me in the Desert Campaign and thereafter often referred to among field surgeons as my test, has recently (Rogers, 1944) been designated, not unkindly but with some lack of euphony, "Donald's explorotomy." Rogers mentions the test as if it were generally known, and does not elaborate it. Lest other references should appear I feel it advisable to put a description on record; otherwise the implications and limitations may not be understood. The circumstances attending its origin are not without interest.

In the casualty clearing stations behind El Alamein there was great congestion of casualties for the first week or so of the battle. Only first priority cases could be operated upon; all else had to travel on to the base hospitals, not far away in distance but a fair way in time. The first priority cases were numerous enough to overwork the surgeons, and among abdominal cases there had to be a discrimination as to who were worth operating upon and who were not, to an extent that I have not seen repeated.

Most penetrating wounds of the abdomen are easily diagnosed. With experience on the part of the surgeon the proportion of doubtful penetrations, usually with wounds of entrance at a distance, becomes less. But till that experience is gained, and after then in lesser degree, there are cases in which doubt remains and precious hours are allowed to pass in waiting for more signs. The alternative is an exploratory laparotomy. When severe casualties are waiting their turn in large numbers, as at El Alamein, it is galling to do a negative

laparotomy of the usual searching kind, and under field conditions this wastes more than a good hour of time and a great deal of energy.

It soon became apparent to me that no missile ever entered the peritoneal cavity without, by the time the patient reached the surgeon, there being some blood, little or much, in the pelvis. Such did not necessarily imply that a viscus had been injured, only that the abdominal wall had been completely pierced, with some bleeding from it into the general peritoneal cavity. Even without visceral injury there could be a large collection of blood if a particular vessel in the parietal wall had been hit; there was always some. From civil practice one recalls how irritatingly a stab incision through the abdominal wall can bleed until it is tautened on the drainage-tube. The absence of any blood in the pelvis, conversely, meant that the parietal wall had not been pierced.

The Method.—A time-saving, and life-saving, procedure in doubtful cases, based on this fact, seemed justifiable in the conditions then existing. Instead of the usual large laparotomy, turning over of the gut, and palpation of other viscera, a small 1½-in. exploratory incision, halfway between umbilicus and pubis, was made. Through this a swab on a long holder was passed to the pouch of Douglas. If no blood was found on the swab the incision was closed. If the swab was blood-stained the wound was extended into a proper laparotomy, which might or might not reveal visceral injury as well. The small incision was made through the rectus muscle, as any extension necessary then produced what was regarded generally as the quickest and best of abdominal incisions in abdominal injuries—the vertical rectus-splitting. The procedure does not take more than 20 minutes, time for induction of anaesthesia included.

The value of a test depends in great measure on its proper performance and interpretation. It is necessary, for instance, to make sure that the swab on the holder is not soiled on its passage through the small exploratory hole. Again, a purely retroperitoneal injury, perhaps necessitating laparotomy, will of course not give a positive result, but the position of the wound, the signs, and often the odour from it, will not lead one into the performance of the test under these conditions.

While I did not advise the test to be done save under exceptionally busy circumstances, where the greatest good of the greatest number was the prime consideration, it would now be of interest to know of any other experiences in the matter. Personally I have not heard of an instance where a negative finding on the swab did not mean one could shut up the small incision with confidence. While the same thought of the underlying principle must have entered other surgeons' minds, I have found no note of it in the literature, and experienced surgeons of the last war tell me it was not a practice known to them.

Rogers, in the article above referred to, indicates the value of the test in those few cases in which the signs leave doubt as to the advisability of operating, and (*a*) the amount of shock seems out of proportion to the external wounds, (*b*) the haemoglobin and red cell count are lower than normal in early cases or the white cell count higher than normal in late cases, and (*c*) the failure of the patient's condition to improve in a reasonable time.

While I agree with these indications I think they suggest that the doubt arises only in cases of the relatively ill. I would add the occasional case in which the patient is relatively well but his signs are equivocal, and something—call it clinical sense or what you will—leaves the examiner unhappy as to delaying for what may be precious hours. Writers on the subject of abdominal wounds usually record a proportion of negative laparotomies. If, especially in shocked patients, the exploration can be cut down to what is described above, then lives as well as time may be saved.

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J. McConnell (*Amer. J. med. Sci.*, 1945, **209**, 41) describes an outbreak of epidemic pleurodynia affecting young women in a nurses' training school. The source of the epidemic was not determined. Signs and symptoms referable to the central nervous system were usually present. In three patients the symptoms resembled those of meningo-encephalitis. Attempts to reproduce the disease in animals failed.

CASE-FATALITY RATES OF GAS GANGRENE IN RELATION TO TREATMENT*

BY

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The War Wounds Committee of the Medical Research Council recommended in 1940 a combination of measures for the treatment of gas gangrene—the use of surgery and bacteriostatic drugs to control the infection and the use of polyvalent antitoxin to alleviate the toxaemia. At this time the therapeutic value of antitoxin in clinical gas gangrene had not been assessed. It was shown later, by analysis of the case reports on Army Form I 1241 (Macfarlane, 1943), that the fatality rate was significantly lower among patients who received prompt treatment with antitoxin in addition to surgical treatment; even among those who underwent amputation of the affected limb within six hours of diagnosis the beneficial effect of antitoxin was demonstrable. It seemed clear that, in general, the combined use of surgery and antitoxin was more effective in saving life than either of these measures alone, but it was pointed out that patients in whom the gas gangrene involved the thigh or buttock region showed a poorer response to treatment than those in whom the lower leg or arm was affected. This was thought to be due to the difficulty of controlling the infection in a region with a relatively poor collateral circulation and in which surgical elimination of the infection might be difficult or impossible.

In a later memorandum (M.R.C. War Memorandum No. 2, revised edition, 1943) it was recommended that the initial dose of antitoxin should be increased to 50,000 units, given intravenously; it seemed possible that with a more intensive use of antitoxin and with more effective drugs the fatality rate might be further decreased. The case reports from the Central Mediterranean Force have therefore been analysed to assess the effectiveness of the treatment at present recommended, and to examine the factors contributing to death in those patients who died in spite of such treatment. During the period under review penicillin was increasingly used in addition to or instead of sulphonamide drugs, and it is necessary to compare the effect of the combined treatment with and without penicillin before coming to any conclusion on the efficiency of the therapy now available.

Out of a total of 295 reports of anaerobic infections on Army Form I 1241 between the beginning of the campaign in Sicily and June, 1944, 185 reports have been considered to be typical of cases of gas gangrene, the main criterion being the infection of muscle, since bacteriological confirmation of a clostridial infection was not always given. It was shown in an interim analysis (MacLennan and Macfarlane, 1944) that there was good correlation between the data obtained in the early part of the campaign by personal investigations in the field and those obtained from the reports, and a further check is possible by comparison with the report made by Jeffrey and Thomson (1944) on 33 cases of gas gangrene in the C.M.F. treated with penicillin during the early months of 1944.

I. General Features

Method of Analysis.—The difficulties in the evaluation of therapeutic measures in gas gangrene have been discussed previously. Briefly, because of the many variables involved it is necessary to group together cases which are similar in nature and have received similar general treatment and then to determine within such a group the effect of the particular measure to be evaluated. The main facts which must be taken into account are the adequacy of the treatment with surgical measures, antitoxin, and drugs, and the site of the gas gangrene; other factors, such as the general facilities for evacuation and surgery, must also be considered.

Adequacy of Treatment.—The cases have first been grouped according to the level of treatment with surgical measures and

* Based on a report to the Subcommittee on Anaerobic Wound Infections, War Wounds Committee, Medical Research Council.

antitoxin, in the classification used by MacLennan and Macfarlane (1944):

Class I: Treatment within 6 hours of diagnosis, including surgical measures (excision or incisions) and an initial dose of at least 50,000 units of polyvalent antitoxin, given intravenously.

Class II: Treatment later than 6 hours, *or* with a smaller dose or an intramuscular dose of antitoxin. (Cases in which the route or time of antitoxin dosage was not stated were included in this class.)

Class III: No surgical treatment, or no antitoxin.

This method of classification serves to distinguish in Class I the patients who received the treatment recommended, and the effectiveness of this treatment can be judged by the fatality rate in this class. The treatment in Class II can be broadly defined as being suboptimal in antitoxin therapy, for only 9 of the 78 patients in this class were placed there because of delay in surgical treatment; the difference in the fatality rates of Class I and Class II therefore mainly reflects the effect of prompt intravenous therapy with antitoxin.

Criterion of Adequate Treatment with Penicillin.—The treatment of gas gangrene cases with penicillin was usually systemic. For this analysis the criterion of adequacy has been taken as intravenous or intramuscular injection at the rate of at least 12,000 or 15,000 (Oxford) units every three or four hours. The total dose varied considerably, but the course was usually continued until death in the fatal cases and for three or four days in those which recovered. Some patients received, in addition, local treatment with penicillin, but four receiving only local treatment or an inadequate systemic course have been included in the "No penicillin" group.

It may be noted that the efficiency of the combined treatment including penicillin is being compared with the efficiency of the combined treatment including sulphonamides, and not simply with treatment by surgical measures and antitoxin, for practically all the patients received sulphonamide drugs in addition to or instead of penicillin. Any test of the value of penicillin, as such, in gas gangrene, is therefore bound to be severe, as the effect must be better than that of the sulphonamides in order to be demonstrable.

Site of Disease.—The cases have been grouped in two classes, according to the site of the gas gangrene: Class A, lower leg or arm; Class B, thigh, buttock, shoulder, or back. Approximately Class A is one in which the muscles have a good collateral circulation, and Class B is one in which either the possibility of a collateral circulation is poor or excision is anatomically more difficult.

Conditions for Treatment.—The cases in this series occurred over a period of nearly a year, during which there were considerable changes in surgical teams and in the conditions under which they worked. The high death rate in Sicily and in the early weeks of the Italian campaign may have been due in part to the inexperience of surgeons newly posted, and the rate was in fact falling towards the end of the year (MacLennan and Macfarlane, 1944). During the winter and until the opening of the offensive in May, however, most of the casualties occurred in the Anzio and Cassino areas; the field surgical units were practically in the line, and the conditions for nursing were so difficult that the amount of surgery was necessarily restricted, while the alternative of evacuation by sea or over bad roads was hazardous for patients liable to gas gangrene. Conditions such as these were no doubt mainly responsible for the number of patients in Class III; the disease was established on admission in many of these, of whom some died within an hour of arrival and others were judged unlikely to respond to treatment. The conditions in these areas improved by April, but were clearly inferior throughout to those prevailing during the May offensive. This information is derived from the reports of the Consulting Surgeon, A.A.I., who remarks: "Thus the battle began with an abundance of experienced forward surgeons. . . . The centres were well grouped, and the lines of evacuation short in time and in distance. . . . Never can conditions have been more favourable to good battle surgery."

The change in conditions is relevant to this analysis, for experience and early diagnosis are potent factors in the successful treatment of gas gangrene. In Sicily, and in the early part of the campaign in Italy, penicillin was mainly in the hands of experienced surgeons, since the technique of use was being explored; it apparently came into general use only during March (almost concurrently with the improvement in general conditions), for after this time approximately 80 to 90% of the reported cases received it. It seems probable, therefore, that the patients who received penicillin were on the whole at least as favourably placed for response to any treatment as those who did not receive it.

Inclusion of Cases with Complications.—The various complications among the 185 cases of gas gangrene in this series fall into two categories—those which may be sufficient in themselves as a cause of death, and those which are more immediately relevant to death from gas gangrene:

1. Complications sufficient as a cause of death:
   Head wound, 4; chest wound, 1; abdominal wound, 10; malaria, 2; pneumonia, 1; ? anaphylactic shock, 1. Total 19 cases (10.3%), with 16 deaths.
2. Complications relevant to death from gas gangrene:
   Multiple limb wounds, 33; shock (failure to resuscitate), 4. Total, 37 cases (20%), with 27 deaths.

In three other cases death occurred suddenly, after an initial recovery, from either pulmonary embolism or secondary haemorrhage, which, like renal failure, can be considered as sequelae rather than as complications.

In all, 30% of the cases were recorded as having some complication, but examination of the data shows that the complicated cases are not unequally represented in the different groups, including the groups "penicillin plus" and "penicillin minus," and from a statistical point of view there is no point in excluding such cases from the analysis. The data have therefore been tabulated inclusive of all the cases, but where it seemed of particular interest the rates exclusive of fatal cases with complications have also been given.

Throughout this report a difference is regarded as significant if it exceeds twice its standard error, in which case it would occur by chance less than 5 times in 100 trials. As the numbers of cases in some of the groups is small, the standard errors are high, and if a difference in rates is to be dissociated from pure chance it would have to be dramatic. It should be borne in mind, therefore, that a difference in rates which is not significant on these numbers might be significant with larger numbers but is probably not dramatic.

II. Gas Gangrene of Leg or Arm

The data for the patients with gas gangrene of the lower leg or arm are shown in Table I, the cases being grouped according to the class of treatment with surgery and antitoxin, with and without treatment with penicillin.

TABLE I.—*Gas Gangrene of Leg or Arm*

Class of Treatment	Penicillin			No Penicillin			Difference ± S.E.
	Cases	Deaths	Fatality Rate (%)	Cases	Deaths	Fatality Rate (%)	
Class I ..	23	6	26·1	11	1	9·1	− 17 ± 1
„ II ..	8	2	25·0	30	16	53·3	+ 28 ± 2
„ III ..	1	1	100·0	11	10	90·9	− 9 ± 2

In no case is the difference in the death rate between the two groups, penicillin plus and penicillin minus, statistically significant. In view of the small numbers in Class I, it is of interest to compare the death rates in this class with those of two other groups, reported elsewhere, who received similar but not strictly comparable treatment with surgical measures and antitoxin. The penicillin-treated cases reported by Jeffrey and Thomson (which may overlap to some extent with cases reported on Army Form I 1241) include 12 cases of gas gangrene of the leg or arm. These patients are described as receiving full treatment with surgical measures and antitoxin, including an intravenous dose of antitoxin before or at operation; 11 of the 12 patients recovered. Another series of cases reported previously (Macfarlane, 1943, Table VII) included 24 cases of gas gangrene of the leg or arm treated promptly with surgical measures and antitoxin, with a total dose of more than 20,000 units of antitoxin but without penicillin; 21 of these 24 patients recovered.

It seems clear that in this type of case, given adequate treatment with surgical measures and antitoxin, the expectation of life is high. Many of these patients underwent amputation

and in view of the fact that in the majority of such cases the infection was eliminated from the body before administration of penicillin was begun it could hardly be expected that this treatment would make a difference to the death rate among them.

TABLE II.—*Amputation Rates in Gas Gangrene of Leg or Arm*

Class of Treatment	Penicillin			No Penicillin			Total in Class		
	Cases	Amptns.		Cases	Amptns.		Cases	Amptns. (%)	Fatality Rate (%)
		No.	(%)		No.	(%)			
Class I ..	23	17	73·9	11	8	72·7	34	73·5	20·6
„ II ..	8	8	100·0	30	27	90·0	38	92·1	47·4

The amputation rate among the 38 patients in Class II (shown in Table II) was over 90%, yet the death rate was 47%; this rate is significantly higher (27% ± 11.3) than the death rate among the 34 patients in Class I (20%) who received a prompt intravenous dose of antitoxin in addition to radical surgery. The combination of intravenous antitoxin therapy with surgery is clearly beneficial, and in considering its absolute efficiency it is of interest that the 7 fatal cases in Class I all suffered from some complication, which may have affected the issue.

III. Gas Gangrene of Thigh, Buttock, or Shoulder

It was noted previously that the poorer response to treatment in patients with gas gangrene of the thigh or buttock region might be due to the difficulties of excision, and it was certainly hoped that a more extensive use of antitoxin and of drugs highly effective against clostridia would lead to some improvement. The data for the C.M.F. cases of this type (Class B) are set out in Table III.

TABLE III.—*Gas Gangrene of Thigh, Buttock, or Shoulder*

Class of Treatment	Penicillin			No Penicillin			Difference; ± S.E.
	Cases	Deaths	Fatality Rate (%)	Cases	Deaths	Fatality Rate (%)	
Class I ..	13	5	38·5	11	6	54·5	+ 16 ± 20
„ II ..	8	6	75·0	32	26	81·3	+ 6 ± 16
„ III ..	6	6	100·0	31	31	100·0	No difference

Within each class of treatment with surgical means and antitoxin there was no significant difference in the death rate of the group treated and that not treated with penicillin. The mean death rate in Class I (24 patients, with 11 deaths) was 46% and in Class II (40 patients, with 32 deaths) 80%; the case fatality was therefore significantly decreased (34% ± 12.1) when the recommended treatment was given, but the death rate in this type of case was absolutely much higher than in the cases with gas gangrene of the leg or arm.

Jeffrey and Thomson (1944) report 18 cases of this type which received treatment with surgical measures and antitoxin similar to Class I, in addition to penicillin; of these patients 8 died—a death rate of 44.4%. In a previous series of cases (Macfarlane, 1943) out of 11 patients of this type who received early treatment with surgery and antitoxin, with a total of more than 50,000 units, 6 died (54.6%). In spite of the best treatment which could be given in these circumstances, the death rate from gas gangrene in these sites remains about 45%.

IV. Conclusions on Effect of Treatment

The reduction in the death rate when antitoxin and bacteriostatic drugs were used as recommended in addition to surgical measures affords a striking testimony to the value of the combined method of treatment. It is clear, however, that the ancillary measures had their limitations in a type of case in which surgical excision of the affected tissue may be impossible. It does not appear that this limitation was due to inadequate dosage with antitoxin. The total dose of antitoxin given within 48 hours of onset to patients with gas gangrene of the thigh or buttock (Class I only) is shown in Table IV; similar figures for the group described by Jeffrey and Thomson are included. The death rates were not significantly less among the patients who received a total dose of more than 120,000 units of antitoxin; that is to say, there is no indication that a larger dose would have been of value as a routine.

TABLE IV.—*Dosage of Antitoxin in Class I Cases*

Series of Cases	Total Dose of Antitoxin in 48 Hours						Difference; ± S.E.
	Up to 120,000 Units			Over 120,000 Units			
	Cases	Deaths	Fatality Rate (%)	Cases	Deaths	Fatality Rate (%)	
C.M.F. Army Forms	11	7	63·6	13	4	30·7	32·9 ± 20·4
Jeffrey and Thomson	9	4	44·4	9	4	44·4	No diff.

With regard to the adequacy of treatment with penicillin the cases included in the penicillin group received a dosage which has been estimated to maintain a bacteriostatic level in the blood. In the C.M.F. cases there was no significant difference in the death rate between those who received penicillin systemically and those who did not, even among cases (Class B) in which a decrease might legitimately be expected if effective chemotherapy could compensate for inadequate surgical excision. This does not imply that penicillin is without value in the treatment of gas gangrene (still less that it is without value in the treatment of the patient, for the question of wound-healing has not been considered). Its value as a specific treatment, in the sense that the death rate was lower among those treated, is simply not proved. Whether penicillin controlled the bacterial infection is another matter, and one difficult to assess when several measures were often employed. It seems possible, however, that in a disease in which there is frequently a failure of the circulation through the infected area the local application of penicillin might be the more effective route.

The doses of antitoxin and drugs used appear to be adequate for their purposes and, on the whole, the opinion of surgeons seemed to be that the clostridial infection was controlled. If this was the case the question arises whether other factors were contributing to death in those patients who died in spite of apparently adequate treatment of the infection. In a number of cases the immediate cause of death was renal failure rather than a fulminating toxaemia, and the similarity between this type of case and the crush syndrome was pointed out by Jeffrey and Thomson. It is surely significant that the specific treatment recommended for gas gangrene was highly effective in a type of case in which radical excision was almost always carried out, and much less effective in a type in which excision was sometimes limited in extent. The hypothesis that a toxic substance is absorbed from muscle damaged by trauma or ischaemia is of course not new, but lately, with the recognition of the crush syndrome and the occurrence of massive limb wounds, it has aroused much interest. It is not unlikely that a necrotic bacterial toxin, such as *Cl. welchii* alpha-toxin, might accelerate or augment the liberation of a "muscle toxin" and thus have a potent secondary effect in addition to any direct action on a vital organ. In most cases the danger from such an effect would be minimized by early excision, but where excision is delayed the prevention of local damage may be of great significance. The existence and the nature of such a "muscle toxin," however, have yet to be demonstrated.

The importance of surgical excision of the affected tissue in gas gangrene has long been recognized, but as emphasis has been laid on this procedure chiefly in order to control the infection it seemed possible that bacteriostatic drugs might lessen the necessity for radical surgery. If the resorption of some toxic substance other than the bacterial toxin from gangrenous muscle is a factor in the severity of gas gangrene the situation is changed. On the one hand, if radical excision is practised the drug is probably superfluous as a life-saving measure; on the other hand, if the necrotic muscle cannot be removed and is a source of danger the drug may in fact control the infection—which is its virtue—without altering the outcome of the disease. To mention this possible limitation is of course not an argument against the use of drugs, for the control of the infection by any possible means is a primary necessity; but it may account for the fact that, with the numbers available, it has not been possible, either with the sulphonamide drugs or with penicillin, to show in the statistical sense that the drugs increased the expectation of life.

Summary

In a series of 185 cases of gas gangrene in the C.M.F. reported on Army Form I 1241 the case-fatality rate has been examined in relation to the treatment given. The combined method of treatment with surgical measures, intravenous antitoxin, and bacteriostatic drugs, when given as recommended, was highly effective in reducing the death rate in cases with gas gangrene of the leg or arm. The death rate in cases of gangrene of the thigh, buttock, or shoulder region was approximately 40% in spite of such treatment, even among those who received penicillin systemically. The findings suggest that the specific treatment was generally effective in controlling the clostridial infection, but that in cases in which surgical excision of the affected tissue is limited in extent some factor associated with the local damage to muscle may be contributing to the severity of the disease.

Thanks are due to the Director-General, A.M.S., for access to the reports. I am also indebted to Dr. E. Lewis-Faning for his criticism and the verification of the statistical significance, and to Sir Claude Frankau, Mr. B. W. Williams, and Prof. McIntosh for their comments on various case reports.

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STAPHYLOCOCCAL PYOPERICARDIUM (COMPLICATING TYPHOID FEVER) TREATED WITH PENICILLIN

BY

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Because penicillin has been scarce, and because repeated injections are exceedingly trying to a debilitated patient, it is the rule that local application, whenever this will suffice, should be used in place of systemic treatment. It is recognized, too, that the use of penicillin does not in any sense replace surgical drainage, and that when pus is formed in any quantity it must be evacuated. In the case here described a staphylococcal infection of the pericardium supervened in the course of a very severe typhoid infection. The ensuing pyopericardium was successfully treated by the repeated aspiration of pus and the instillation of sodium penicillin into the pericardial sac.

Case History

An officer cadet, aged 26, was admitted to a military hospital on May 25, 1944, complaining of malaise, nausea, abdominal pain, and constipation for three days. On admission the temperature was 104° and the pulse rate 96. Apart from slight abdominal distension, no definitely abnormal physical signs were present. The urine was normal, and the white cells numbered 4,500 per c.mm. with a normal differential count. Health in the past had been unexceptionable. The most recent immunization with T.A.B. vaccine was in March, 1944.

The patient remained acutely ill, with high sustained fever. The abdominal distension became more marked and a troublesome cough developed. On May 29 *B. typhosus* was isolated from the blood in pure culture. About the same time a scanty macular rose-spot rash appeared on the abdomen. During the next few days his condition still further deteriorated. Constipation gave way to a persistent diarrhoea, with which vomiting was associated. The patient became stuporous and delirious. By June 4 serious dehydration was apparent, and three litres of normal saline were given by intravenous drip. Abdominal distension was pronounced, and there was considerable basal congestion of both lungs. But the fluid was well tolerated, and its administration was followed by a great improvement in condition.

By June 14 the temperature had practically settled, only a negligible evening rise persisting. Progress at this time appeared very satisfactory, but, disappointingly enough, four days later the patient again became seriously ill. The temperature was now 102°, and the pulse, weak and irregular, was 128. The physical signs were typical of a pericardial effusion, there being a definite paradoxical pulse and a positive Ewing's sign. On June 24 the pericardium was needled in the fifth intercostal space, half an inch inside the area of cardiac dullness; 50 c.cm. of thin pus was aspirated. This pus gave a pure growth of *Staph. aureus* on culture. The next day surgical drainage of the pericardium was attempted. A trephine hole was made through the sternum at the level of the fourth cartilage, but pus was not found in the pericardial sac. It was thought that this was due to the aspiration of the pericardium on the previous day.

On June 26 it was decided to needle the left pleura. Pus was not found, and the physical signs at the base of the left lung were those of collapse. The white cell count was 26,600 per c.mm., with an excess of polymorphs. The haemoglobin was 64%. The next day the pericardium was again explored through the trephine hole, and on this occasion pus was found and 4 oz. was evacuated. One pint of fresh blood was given by intravenous transfusion.

The pathologist had now reported the sensitivity of the *Staph. aureus* isolated from the pus withdrawn from the pericardium as being approximately the same as that of the standard "Oxford" *Staph. aureus*—i.e., zones of inhibition around cups containing one Oxford unit of penicillin per c.cm. were as follows: (1) patient's staphylococcus, 19 mm.; (2) Oxford staphylococcus, 28 mm. On June 28, therefore, penicillin therapy was inaugurated, 50,000 units of sodium penicillin being injected direct into the pericardial sac by means of a No. 5 rubber catheter. The superficial part of the operation wound had become secondarily infected, culture giving a profuse growth of *Ps. pyocyanea*. Before catheterization, therefore, the wound was filled with 1/1000 perchloride of mercury for a few minutes and then swabbed dry. This technique was found satisfactory, and there was no difficulty in the repeated passage of the catheter. The penicillin was introduced after aspiration of as much pus as possible and the wound subsequently packed to prevent leakage. The injection of 50,000 units was repeated on five further occasions, giving a total dosage of 300,000 units. The first three injections were given on successive days, and the last three on alternate days. After the third dose of penicillin the pus withdrawn from the pericardial sac was reported as sterile on culture.

On July 1 there was considerable improvement in the clinical condition. This improvement was maintained in spite of a sharp attack of diarrhoea, which responded satisfactorily to sulphaguanidine therapy. By July 10 the temperature was once again normal. On this day a further pint of blood was transfused. The haemoglobin prior to transfusion was 70% and the white cell count 14,500 per c.mm.

On July 17, however, there was a renewal of the fever, with the temperature rising to 102°. Some abdominal distension was still present and the pulse was again markedly paradoxical. The spleen was felt "two fingers" below the costal margin, tenderness and rigidity were noted over the right upper abdomen, and there were physical signs of a considerable effusion in the right chest. It was clear that fluid had once again accumulated in the pericardium, and 20 c.cm. of thin sterile pus was aspirated from it. Eighteen ounces of clear yellow fluid, sterile on culture, was also withdrawn from the right pleura. Some improvement followed this, but in view of increasing dyspnoea it once again became necessary to aspirate both pleura and pericardium, 15 oz. being withdrawn from the former and 15 c.cm. from the latter.

By Aug. 2 there was still an evening rise of temperature to about 100°. Signs were now apparent of fluid in the left chest, and 12 oz. of sterile heavily blood-stained fluid was aspirated. The spleen could still be felt and the liver was palpable one inch below the right costal margin. Slight oedema of the ankles was noted. Further exploration of the right chest produced only 3 c.cm. of fluid. No more could be obtained.

On Aug. 17 the patient was again transfused. In view of the persistent pyrexia a course of systemic penicillin was given, 15,000 units being injected every three hours for three days. This produced no improvement in the clinical picture, and it was abandoned, as it was proving very exhausting. At this time another 14 oz. of blood-stained fluid was withdrawn from the left chest. The white cell count had dropped to 10,000 per c.mm., the haemoglobin was 75%, and the red blood cells 3,650,000 per c.mm. The general condition had improved. The blood pressure was 110/75, with no paradoxical pulse or evidence of cardiac tamponade. The liver and spleen were no longer palpable, nor was there reaccumulation of the pleural exudates.

The evening rise of temperature still persisted, and there now developed a very tender swelling over the lower left costal cartilages. A diagnosis of typhoid periostitis was made, and on Sept. 7 operation was performed under local analgesia, a transverse incision being made over the costochondral junction. Thickened inflamed tissues were found with a small quantity of pus beneath the periosteum. The bone was curetted and drained and the wound packed with vaselined gauze. Thereafter convalescence was slow but consistent. By Oct. 10 the patient was well enough for repatriation to the United Kingdom by hospital ship.

Comment

The occurrence of a staphylococcal pyopericardium in the case of a soldier already gravely ill with typhoid fever

recorded. The successful treatment of this complication by penicillin instillation and repeated aspiration is described. The therapeutic result in the local treatment with penicillin depends upon whether it proves possible to maintain permeation with an adequate concentration of the drug. There are special difficulties in dealing with the infected pericardium. It is difficult to be certain that, when aspiration is done, adequate drainage in fact has been achieved. With extensive infection of the superficial wound of the chest wall it is hard to ensure that the pericardial sac is not contaminated with secondary invading organisms which are penicillin-resistant.

In the case of empyema thoracis similarly treated it is common to get a residual grossly thickened pleura and a rigid chest wall. Rib resection may be necessary to remove extensive fibrinous deposits from the empyema cavity. The end-results in pyopericardium, in which the scope of surgery is more limited, are likely to be less satisfactory. Attention is particularly directed to the long period during which the reaccumulation of sterile pus in the pericardium persisted.

Medical Memoranda

Impacted Foreign Body in the Bronchus of an Infant, causing Collapse and Obstructive Emphysema

The case here recorded is thought worthy of publication because of the occurrence of both collapse and obstructive emphysema in the same lung after impaction of a foreign body in the bronchus of an infant. The obstruction was successfully removed by bronchoscopy.

CASE REPORT

A male child aged 1 year attended the out-patient department of Belgrave Hospital for Children on Nov. 17, 1944, with a history of wheeziness and cough following a choking fit after eating some nut chocolate five days previously. On examination he was found to be healthy-looking and well nourished. There was diminished air entry with an impaired percussion note, as well as much diminution of breath sounds below the right clavicle over an area corresponding to the right upper lobe. The percussion note was hyperresonant over the lower part of the right side. There was some mediastinal displacement towards the right. The left side showed no signs. No abnormal physical signs were found in any other system. His temperature was 99°, pulse 154, respirations 48. He was admitted to the wards. A radiograph taken on admission showed complete collapse of the right upper lobe, with mediastinal displacement to the right and very well marked emphysema of the right middle and lower lobes. On Nov. 20 a radiograph showed increased collapse of the right upper lobe and increased emphysema of the right middle and lower lobes. He was transferred to the London Chest Hospital and bronchoscoped the same day by L. G. C.

Bronchoscopy Report.—Foreign body seen in the right main bronchus projecting into and completely blocking the right upper lobe bronchus but only partially obstructing the main stem bronchus. The foreign body was removed; it appeared to be a piece of nut.

A radiograph taken on Nov. 21 showed that the collapse of the right upper lobe had almost completely cleared, the mediastinum was nearly central, and there was no emphysema in the remainder of the right lung. On Nov. 23 the patient returned to Belgrave Hospital, where he made an uneventful recovery except for an attack of tonsillitis. On Dec. 28 radiographs showed that both lung fields were normal in appearance and the mediastinum central. He was discharged on Jan. 3, 1945, without any physical signs; pulse, temperature, and respiration were normal.

We wish to thank Dr. Norman Hill and Mr. V. C. Thompson for permission to publish this case.

URSULA JERRAM, M.R.C.S.,
Late Senior Resident House Officer,
Belgrave Hospital for Children.

L. G. CRUICKSHANK, F.R.C.S.Ed.,
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A Case of Aberrant Suprahyoid Thyroid Tumour

Aberrant thyroid tumours are recorded from time to time, but the occurrence of two separate tumours, one lying above the hyoid and the other just below the left cornua of the hyoid, is unusual.

CASE REPORT

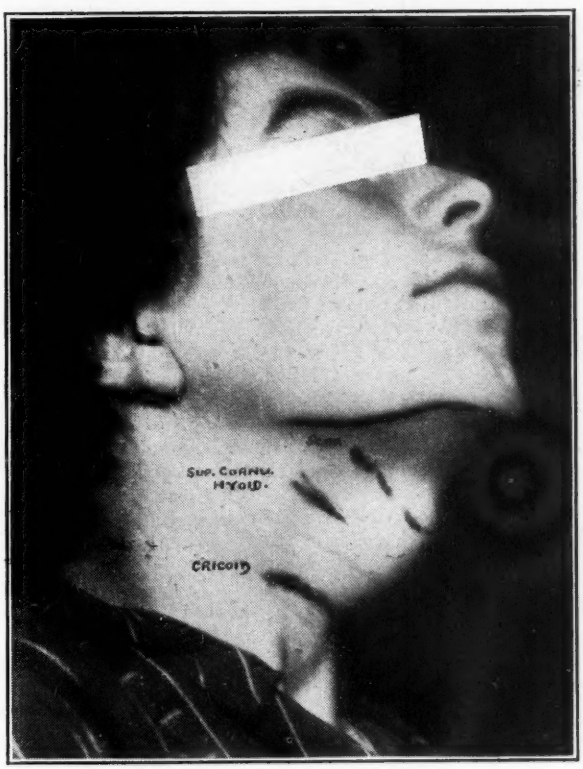
A spinster aged 30 attended the out-patient department and was found to have a solid tumour, the size of a small hen's egg, lying in the midline between the mandible and the hyoid bone. She was a nervous, mentally deficient but pleasant young woman, who weighed over 9 st. and had a large fat face with prominent eyes. The fat was found chiefly on the trunk and face, and the legs and arms were thin in proportion to the rest of the body. She was of rather short stature, and her skin was dry, soft, and smooth. Menstruation was normal. Radiographs of the thorax did not reveal the presence of any thoracic tumour. A provisional diagnosis of a subfascial lipoma was made and the patient was admitted to hospital for operation.

Operation.—Under local analgesia a plum-coloured tumour was exposed and easily removed. It lay entirely above the hyoid, deep to the mylohyoid muscles, and there were no connexions which suggested remnants of the thyroglossal duct. About one inch from the left lower border, at the level of the superior cornu of the thyroid cartilage, there was a separate tumour the size of a small walnut, which appeared to be normal thyroid tissue. As the rings of the trachea could be easily palpated, and no thyroid gland could be felt, the second tumour was left alone. The patient was discharged seven days later.

The specimen had the appearance of a cystadenoma, into which haemorrhage had occurred. The pathological report, from Dr. Popjak, was as follows: "Atypical epithelial hyperplasia in ectopic thyroid. The tissue consists of solid masses of polygonal or cuboidal epithelial cells, having a pale-staining slightly granular cytoplasm and round nucleus, or small acini free of colloid. The latter are lined by a high columnar epithelium. At the periphery of the specimen there is a good deal of fibrosis and at the centre hyaline degeneration. There was no definite evidence of malignancy."

Post-operative History.—The patient was seen at intervals, and in a year lost 8 lb. in weight. The remaining tumour has enlarged and is now the size of a plum. Its consistence suggests cystic changes, and its removal may be necessary.

Moritz and Bayless (1932) state that the large majority of aberrant thyroid tumours are found in females in the third decade, and this case conforms with their findings. Lazarus and Rosenthal (1933) believe that 75% of aberrant thyroid is neoplastic, while Ward (1940) found 9 out of 12 of his cases to be malignant. Probstein and Agress (1936) consider that median tumours are usually simple and the laterally placed tumours malignant.



The photograph shows the situation of the present tumour, and the facies and distribution of fat.

I wish to thank Dr. Popjak for his report, and Mr. de Rynck for his kindness in taking the photograph.

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Reviews

HUMAN EMBRYOLOGY

Human Embryology. By W. J. Hamilton, M.D., D.Sc., J. D. Boyd, M.D., M.Sc., and H. W. Mossman, M.S., Ph.D. (Pp. 366; illustrated. 31s. 6d.) Cambridge: W. Heffer and Sons.

To the medical student of average ability, embryology is an extremely difficult subject for study. And well it may be, for, starting with microscopical sections of embryos, it involves two separate steps in mental reconstruction. First, sections which are approximately two-dimensional have to be strung together to form a semblance of the three-dimensional system, and then the three-dimensional systems require to be linked up in a time series in order to appreciate the gradual changes that occur during progressive development. The mental processes involve considerable powers of visualization, the aptitude for which (as every teacher of anatomy knows) varies greatly from one individual to another. Thus, to be really successful, a textbook of embryology needs to be amply and carefully illustrated, and this feature has been by no means a strong point in British textbooks of embryology in the recent past. Without doubt, therefore, the new textbook by Hamilton, Boyd, and Mossman will receive an enthusiastic welcome, for one of its outstanding qualities lies in the excellence of the illustrations. They are both numerous and exceptionally clear, and the frequent intermixture of accurate drawings of sections with realistic diagrams of reconstructed models should make it a relatively simple matter for the student to follow the text descriptions.

But, fine as the illustrations are, they are not the only outstanding character of this book. The authors are all embryologists of distinction and have themselves made important original contributions to their subject. In addition, they clearly possess a comprehensive knowledge of the literature. They have evidently set themselves out to produce a textbook which is readily intelligible to the ordinary student and at the same time accurate in detail and authoritative in interpretation. They have succeeded to the extent that their book will certainly be regarded as the students' standard textbook on human embryology in the English language. The descriptive accounts of embryological anatomy at various stages of development follow orthodox lines, and they are clear and detailed. Some may think that in certain sections they are perhaps too detailed for the average medical student, but here we sympathize with the authors in what must have been a very difficult task—the selection of material judged necessary for a liberal medical education. No two anatomists are likely to agree in these matters, and we consider that on the whole the authors have shown a judicious attitude to the problem. Each chapter is supplemented with a list of appropriate references to original papers to which the interested student may have recourse in order to amplify his knowledge, and the occasional discussions in the text on conflicting views should certainly stimulate the reader to do so. The inclusion of sections on foetal embryology is a welcome addition, expressive of the interest which this aspect of embryology has aroused in research laboratories during recent years.

We have suggested that this book will be accepted as a standard textbook. It follows, therefore, that it is likely to see a long run with a succession of editions. For this very reason the book is particularly worthy of a critical review, and we would offer the following suggestions for the consideration of the authors. The terminal chapter on comparative vertebrate development is the least satisfying part of the book, for it has too much the appearance of an appendix inserted as a sort of afterthought. It is too short and condensed to be of real value, and the diagrams which illustrate it are cramped and confused. Probably the chapter should be omitted altogether, and such information as it contains which has a direct bearing on the interpretation of human development inserted at the appropriate place in the main part of the book. In any case, comparative vertebrate development is such a vast subject as to require a separate textbook altogether. We would also suggest (if it is feasible) that the story of the dynamics of embryological development be more closely interwoven with the purely descriptive sections, so as to interrelate these aspects of developmental processes as closely as possible. We recognize that this is by no means an easy thing to do; yet it is an ideal to be aimed at if the student is to achieve a proper synthesis of the facts of development and the underlying processes of which they are the visible manifestation. Lastly, the book would certainly gain in value if the magnifications of the photomicrographs and illustrations of models were indicated in each case.

To review such a book as this is a real pleasure, and at the same time something of an honour. For it is a learned and erudite book, written and prepared with great care. Moreover, it is a welcome sign of a resurgence of anatomical science in this country which will go far to enhance the prestige of British Anatomy.

AN OUTLINE OF PHARMACOLOGY

Pharmacology. By Michael G. Mulinos, M.D., Ph.D. With foreword by Charles C. Lieb, M.D. Oxford Medical Outline Series. (Pp. 482. 25s.) London: Oxford University Press.

This is a useful book either for the student who wishes to learn quickly for an examination or for a doctor who wishes to have a book of reference to guide him in treatment. For example, on page 82 is to be found a section on tapeworm infestation. First there is a list of the three species which commonly infest man, and the origin and locality of these species. Next comes the diagnosis and after that a list of the symptoms; then methods of prophylaxis; then drug therapy, giving the details of preparing the patient, and the details of treatment, including second, third, and fourth methods of treatment should one method after another fail. Then are given details of the various drugs, in which is explained that oleoresine of aspidium *U.S.P.* is a dark-green liquid which is an ethereal extract of male fern; and the action and toxic symptoms are described. The book is thus a catalogue arranged under main headings A, B, C, etc., subheadings 1, 2, 3, etc., further divisions a, b, c, etc., and subdivisions (1), (2), (3), etc. This method of explaining the use of drugs is of great value to the house-physician who is learning to use them for the first time, when he needs something written in the style of a cookery book. It is, however, less suited to the use of drugs in a disease like syphilis, where treatment cannot be reduced to tabular form so easily. This is a book of moderate size and easy to read; it is conveniently interleaved with blank pages for notes, so that it is possible for anyone to carry the book with him and record his experiences in applying any method.

Dr. Mulinos thus presents another answer to the question "What is pharmacology, and how is it to be taught?" With the growing feeling that treatment is greatly in need of improvement, the answers become increasingly numerous. Some stress the theoretical background, others the practical application. Probably all are valuable if only the young physician is determined to discover from some authority what things can be done and is able to find time to try them.

BIOLOGICAL BASIS OF INDIVIDUALITY

The Biological Basis of Individuality. By Leo Loeb. (Pp. 711. $10.50 or 58s.) Springfield and Baltimore: Charles C. Thomas; London: Bailliere, Tindall and Cox. 1945.

Individuality is used in this book to emphasize the distinctive unique features which a person possesses, and the physical features alone are dealt with. If we conceive of an individual as a mosaic of many tissues and organs, each one functioning and metabolizing in its own peculiar way, we may consider this mosaic of separate parts as the biological basis of individuality. There is, however, another basis which is comprised of properties common to all parts of the organism which can be discovered by observing the reactions of certain cells and tissues of one individual towards the tissues and cells of another individual. This is the theme of the 700 pages of this book.

Part I deals with tissue transplantation, and shows how the violence of reaction is in inverse proportion to the nearness of genetic relationship of the individuals concerned, though certain substances—e.g., hormones and vitamins—may not be destroyed when introduced into a strange host. The relationship of tissues within the individual organism is important in the study of the formation of antigens, and also of tumour

formation. Part II deals with the phylogenetic and ontogenetic development of these individuality and organismal differentials from the lowest organisms and from the egg to the adult state. Part III deals with the differentials as found in the single cell, whether in protozoa, the leucocyte, or in the germ cells. Part IV deals with organismal differentials in tumours which represent modified tissues. Part V shows the part played by organismal differentials in the maintenance of the harmony of the organism as a whole, and in the interaction of the organs and tissues within the organism. Part VI deals with antigen and immune substances and how they are related to individuality differentials. Part VII shows the relation between the evolution of species and organismal differentials. Part VIII illustrates the significance of individuality differentials in the psychical social field; it is here that the concept of individuality had its origin. A full bibliography is appended.

This is a highly technical book and very comprehensive, and there is no doubt that it contains much valuable material for the study of many vital problems in heredity and pathology.

Notes on Books

For the third edition of *The Infant. A Handbook of Management* (H. K. Lewis and Co.; 4s.) Drs. W. J. PEARSON and A. G. WATKINS have added a section on preventive inoculation, and they also include a new table of vitamin requirements. A table on the daily allowances of essential food elements, based on the Hot Springs conference, brings this modest little book well up to date.

The Permanent Central Opium Board of the League of Nations has issued a pamphlet, *Pre-War Production and Distribution of Narcotic Drugs and their Raw Materials*, which is obtainable in this country from Allen and Unwin Ltd., 40, Museum Street, London, W.C.1, at 2s. This report summarizes and analyses the mass of world-wide information on drugs which the Board has received. It shows the importance of each country as a producer, and puts on record the quantities and method of disposal of the raw materials and manufactured drugs by both producer and consumer countries. The details will be of interest chiefly to technicians, but the main facts and conclusions are of wider concern.

Miss MARY V. LACE's book *Massage and Medical Gymnastics* was first published in 1936 with a foreward by Dr. James Mennell. A second edition appeared in 1941 and a third has now reached us (J. and A. Churchill; 12s. 6d.). During the past four years there have been many changes in physiotherapy, largely following the development of what is commonly known as rehabilitation. The emphasis on active rather than on passive treatment, which the popularization of this term has brought about, has been beneficial, but the simple basic movements should be thoroughly learnt by students. Though many suggestions about free exercises and useful occupations are added in this edition, the basic exercises are therefore retained.

Preparations and Appliances

A CONVENIENT TYPE OF OXYGEN TENT FOR PREMATURE INFANTS

Dr. L. SAGORIN, D.C.H., paediatric resident medical officer, E.M.S., writes:

It is now generally agreed that oxygen therapy has an important place in the management of certain types of premature infants (Hess and Lundeen, 1941; Tow, 1942), particularly those showing signs of an inadequately developed respiratory centre, with poor respiratory movements and consequent insufficient oxygenation resulting in cyanosis and weak cardiac action.

To be of any use the oxygen must be administered early and by an efficient method. When given by "tube-and-funnel," nasal catheter, or by a tube in the mouth it is of very dubious value. The infant requires a high oxygen tension, and the best type of apparatus is some form of tent or oxygen chamber.

As the standard type of oxygen tent for infant use was not always immediately available, some form of temporary apparatus had to be devised until a tent was available. The apparatus found most suitable consists of a modification of the "hospital respirator." The rubber bellows and filter are removed and their attachment to the tent sealed off with zinc plaster. The oxygen is introduced through a cylindrical tube at the side of the tent, and this inlet ends above the infant's head. The infant is placed in the tent; a hygrometer is inserted. The side-flaps are tucked under the infant and the tent covered with the requisite number of bedclothes, folded up to the window. The longitudinal fold is not tucked under the infant, as this unnecessarily raises the humidity in the tent and the concentration of

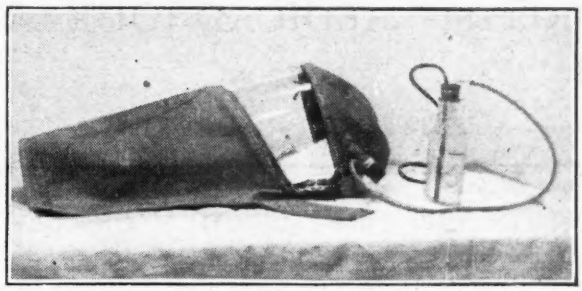

FIG. 1

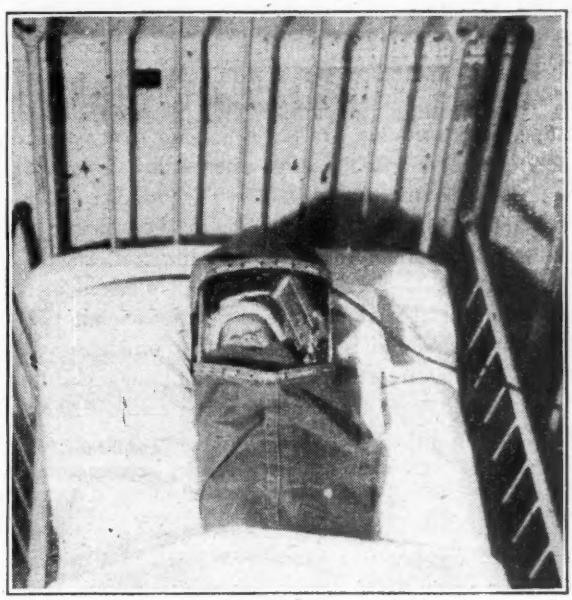

FIG. 2

oxygen. Temperature is maintained by hot-water bottles outside the tent.

Management.—An oxygen flow of 2 litres per minute produces a concentration of 80% in 10 minutes. After 3 hours the concentration diminishes to 65–70%. The carbon dioxide does not rise to above 1.5%, and an absorber is not necessary. The tent is opened at 3-hourly intervals for feeding and changing, and an adequate concentration of oxygen is always easily maintained. As a high percentage humidity is desirable for premature infants it is convenient to use a combined humidifier–flowmeter, when a humidity of 60–80% (depending on the weather conditions outside) is obtained. If the humidity rises above 80% the oxygen is run dry with the use of an ordinary flowmeter until the desired humidity is obtained.

Though originally introduced as a temporary measure, this tent has been found more useful, more practicable, and more economical than the larger type of canopy tent. With the latter the highest concentration of oxygen we could attain varied between 45 and 50%, and this with a flow of 6 to 8 litres per minute; furthermore, adequate humidity was difficult to maintain without the presence of basins of water in the tent.

The nursing staff find the infants easily accessible for feeding and changing. When necessary the tent can be transported in an ambulance or car for premature infants brought into hospital from outside. These tents have now been in routine use for the past nine months and have been found to be eminently satisfactory. Apart from premature infants under a birth weight of 3 lb. there have been no deaths during the first fortnight of life.

I am indebted to Dr. N. M. Jacoby for his constant advice and helpful criticism, to Dr. G. D. Grasby for permission to use the tents, and to Sister M. I. Wilcock and her nursing staff for their unfailing co-operation.

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SYRINGES, SERUM, AND JAUNDICE

Jaundice, long known as a disease of campaigns, must now be regarded as a disease of clinics also. It is well known that our troops suffered a series of annual epidemics of infective hepatitis when they were fighting in the Middle East and North Africa,[1] but it is no less memorable that outbreaks of jaundice on a commensurate scale have occurred in this war in consequence of prophylactic and therapeutic procedures. In the American Army more than 28,000 men developed jaundice after yellow-fever vaccination in the early months of 1942.[2] The jaundice was traced to the human serum used in making up the vaccine, and on omitting the serum from the vaccine the outbreak of jaundice was abruptly halted. In this country the incidence of post-arsphenamine jaundice rose steadily during 1941 and 1942, until some clinics were recording jaundice in 46 and 68% of patients treated.[3 4] MacCallum[5] suggested that the jaundice was due to transmission of infection from patient to patient by means of traces of blood left in the syringes, which at that time were not sterilized by heat between cases in most venereal clinics, and Bigger[6] demonstrated that the technique then employed was inadequate to prevent the passage of an infective agent. Salaman and co-workers[4] then showed that if a careful aseptic technique was used, with a sterile syringe for each patient, the incidence of post-arsphenamine jaundice could be reduced practically to zero, and as a result partly of this demonstration, partly of the introduction of penicillin, post-arsphenamine jaundice has joined the list of vanishing diseases. The belief that post-arsphenamine jaundice was due to the transfer of a virus from patient to patient in the syringes has been further strengthened since MacCallum[7] demonstrated by inoculation of human volunteers that an icterogenic agent is present in the serum in post-arsphenamine jaundice. Both yellow-fever–vaccine jaundice and post-arsphenamine jaundice must therefore be regarded as examples of the variety of jaundice now known as homologous serum jaundice.[8] The common factor is the contamination of the inoculation with small quantities of human plasma or serum which contains an icterogenic virus.

Another example of what appears to be the same variety of jaundice was recorded by Droller in the *Journal* of May 5, 1945. Droller studied an epidemic of jaundice which attacked 62 out of 450 patients attending a diabetic clinic. Analysis of the case incidence and incubation periods suggested that the epidemic was homologous serum jaundice, and the severity of the jaundice was in keeping with this suggestion. In the same number of the *Journal* Mendelssohn and Witts demonstrated that a virus could have been transmitted in the syringe used for obtaining blood for blood-sugar estimations, and it is noteworthy that the epidemic came to an end on discontinuing venepunctures. Similar epidemics of jaundice have been noted in other diabetic clinics,[9 10] and also in rheumatism clinics[11] and sanatoria[12] where blood is often taken for estimation of the blood sedimentation rate. In none of these instances has it been proved yet that the blood contains a virus, as has been demonstrated by human transmission experiments in post-vaccinal and post-arsphenamine jaundice; but anyone dealing with an epidemic of jaundice of this type must now adopt the working hypothesis that the jaundice is due to transfer of a virus in the syringes used for injection or for withdrawal of blood samples, and must see if the epidemic cannot be brought to an end by improvements in aseptic technique.

If communal syringes are used in a clinic for the withdrawal of blood or the intravenous injection of drugs, a single carrier may in course of time infect all the patients attending the clinic, and, as already noted, as many as 68% of the patients may develop overt jaundice. Seeing that the virus of hepatitis is highly infective, even in the small amounts of plasma which are transmitted from patient to patient under these conditions, and that it offers considerable resistance to antiseptics, heat, cold, drying, and prolonged storage, the reader may well ask what are the risks when large amounts of whole blood, plasma, or serum are deliberately transfused. Whole-blood transfusions had been used on a large scale for some years before the war, and there is little to suggest that they were at all commonly followed by homologous serum jaundice. Plasma and serum, on the other hand, are wartime expedients, and information about them has been difficult to collect owing to the dislocations of war, the rapid transfer of patients, and the long incubation period of homologous serum jaundice. Early in the war a good deal of work was done on burns, and large amounts of plasma and serum were used in treatment. The clinicians were interested in the possibility of liver damage from the burned tissue and the coagulant applications, so that it seems unlikely that homologous serum jaundice would have been missed; but here again late jaundice was not reported. Latterly, however, experience has not been so favourable, and unpublished figures suggest that homologous serum jaundice has occurred in as many as 10% of some series of patients in whom blood plus plasma or serum has been given for resuscitation from war injuries. The mortality has been appreciable. To put matters in their proper perspective we must remember that 96% of wounded men are now being saved, and the high recovery rate is in large part due to the development of transfusion.

We must conclude that in the present state of knowledge transfusion inevitably carries a delayed hazard, and plasma and serum should be administered with the same care as dangerous drugs. In haemorrhagic and traumatic shock

1 Witts, L. J., *British Medical Journal*, 1944, **1**, 739.
2 Editorial, *J. Amer. med. Ass.*, 1942, **119**, 1110.
3 Beattie, J., and Marshall, J., *British Medical Journal*, 1944, **1**, 547.
4 Salaman, M. H., *et al.*, *Lancet*, 1944, **2**, 7.
5 MacCallum, F. O., *Brit. J. ven. Dis.*, 1943, **19**, 63.
6 Bigger, J. W., *Lancet*, 1943, **1**, 457.
7 MacCallum, F. O., ibid., 1945, **1**, 342.
8 Memorandum of Ministry of Health, *Lancet*, 1943, **1**, 83.
9 Graham, G., *Lancet*, 1938, **2**, 1.
10 Vannfält, K. A., *Acta med. scand.*, 1944, **117**, 462.
11 Hartfall, S. J., *Lancet*, 1944, **2**, 358.
12 Sheehan, H. L., ibid., p. 8.

it is legitimate to take risks and to use dangerous remedies, but in other conditions in which life itself is not at stake the advantages of transfusion should be carefully weighed against the disadvantages. The risk might be expected to be proportional to the number of donors who have supplied the blood or plasma, and the mixing of icterogenic with non-icterogenic material may even increase its virulence.[13] On theoretical grounds, therefore, whole blood should be safer than plasma or serum, which are pooled products, and small pools of plasma or serum should be safer than large. Active research is being performed to settle these questions and also to determine if the virus cannot be inactivated during the processing of plasma and serum. In the meantime it is incumbent on anyone who gives a transfusion to record the case history, the details of the transfusion, and the identification numbers of the bottles of blood, serum, or plasma in such a way that both they and the patient can subsequently be traced. Whenever possible a patient who has received a transfusion should be kept under unobtrusive supervision for the next six months, and his medical attendants should be informed of the fact of transfusion. In this way a subsequent attack of homologous serum jaundice may be diagnosed in the pre-icteric stage, when prompt treatment by bed-rest may mitigate the severity of the illness.

The relationship of the viruses of homologous serum jaundice and infective hepatitis is still unsettled. Provisionally they must be regarded as two separate varieties of the same species, though it may prove that they are different phases of the same virus. The morbid anatomy of the two diseases is identical. They differ in the longer incubation period of homologous serum jaundice—approximately three months as compared with one month for the spontaneous disease—and in the greater severity and higher mortality of homologous serum jaundice. It is also uncertain whether patients suffering from homologous serum jaundice ever pass on the disease to others by contact, droplet, or excremental infection, and data on this problem should be collected and reported wherever possible.

THE TREATMENT OF BACTERIAL ENDOCARDITIS

In a series of papers S. R. Kelson, P. D. White, and other collaborators[14] analyse a large number of cases of subacute bacterial endocarditis seen at Boston and elsewhere in the U.S.A., and by grouping them into three therapeutic periods they give a clear picture of what has recently been achieved in the treatment of this disease. These papers provide the most important contribution to the literature of their subject for some years, and contain much information of interest from other points of view than the therapeutic. The first group consists of 250 cases seen in Boston between 1927 and March, 1939; only 33 of these were treated with sulphonamides; the other treatments employed were of forty-three different kinds. Only one patient made even a temporary recovery, to die of rheumatic carditis a year later; he had received no specific treatment. A second group between 1939 and 1944, all treated with sulphonamides, consists of 77 patients, of whom 6 recovered: 3 of these and 14 of those who died also received heparin. A combination of heparin and sulphapyridine, according to Kelson, affords the best prospects of success, and in a separate paper, dealing with another group of 34 patients, he records 8 apparent recoveries following this treatment, together with two others in which sulphadiazine, and both sulphadiazine and penicillin, were combined with heparin. A third small group in the main series comprises 9 patients treated with penicillin, 4 of whom have apparently recovered, while in 2 others the infection was suppressed, although they are now ill or dead from other causes.

A more complete picture of what penicillin will do in this disease is afforded by the observations of L. Loewe,[15] who has now treated 54 cases, with 14 failures and 40 successes, 37 of the latter being alive from 2 to 15 months later and 3 dead from other causes. It is an important feature of this author's method that every patient is also given heparin, not intravenously but subcutaneously in a gelatin menstruum from which slow absorption takes place; the necessary dose, usually about 300 mg. every second or third day, is determined for each case by estimations of the coagulation time, which is kept at between 30 and 60 minutes. He strongly advocates that penicillin should be given by continuous intravenous infusion in order to maintain a constantly adequate level in the blood. What that level must be depends on the sensitivity of the streptococcus in each case, and he recommends that the aim should be to maintain a concentration 5 to 10 times greater than the minimum required to inhibit the growth of the organism. M. H. Dawson and others[16] have previously reported very wide variations in the susceptibility to penicillin of different strains of streptococci from cases of endocarditis, and anyone who has studied these organisms knows that their characters are almost infinitely variable. The concentration of penicillin required to inhibit the growth of strains from Loewe's cases varied from 0.007 to 0.5 unit per c.cm; 3 strains exhibiting high resistance are said to constitute a distinct and hitherto undescribed variety, and treatment failed in the cases from which they were derived. The regulation of dosage on this principle resulted in variations in the daily dose between 40,000 and 1,000,000 units, and in the total amount given between 867,000 and the enormous figure of 48,930,000 units. An inadequate dose may cause the streptococcus to develop resistance; a forty-fold increase in its resistance was observed in one case. The duration of treatment should depend on that of the disease, but if possible a five-weeks course should be the minimum. Loewe considers that in cases of less than three months' duration, due to a reasonably sensitive organism and in patients in good physical condition, a good result may be expected in almost every case. It does not follow, of course, that such patients will be restored to normal health. Gross valvular incompetence must remain, and of those patients who have undoubtedly been cured of their infection during the past few years, a number have succumbed later to progressive cardiac failure.

[13] Andrewes, C. H., *Lancet*, 1944, **2**, 159.
[14] *Ann. intern. Med.*, 1945, **22**, 40, 61, 75.
[15] *Bull. N.Y. Acad. Med.*, 1945, **21**, 59.
[16] *Proc. Soc. exp. Biol. Med.*, 1944, **56**, 101.

Another American report on this subject is by M. H. Dawson and T. H. Hunter,[17] who have treated 27 cases in three groups. The first 5 were carefully selected favourable cases treated with penicillin only; since 2 of these relapsed but later recovered completely after a course of penicillin combined with heparin, administered in 1 case by Loewe himself, the next 15 were all given heparin by Loewe's method in addition to penicillin. Of these 15 patients, 11 recovered, 2 died, and 2 are still suffering from the disease. A final series of 7 cases has recently been treated, of which 5 had no heparin, with so far apparently equally good results; whether heparin is helpful is therefore a question still *sub judice*. Dawson and Hunter agree with Loewe that the dose of penicillin should be determined by the degree of sensitivity of the streptococcus—cases with hopelessly resistant organisms being rejected—and that a prolonged continuous course is necessary.

The treatment of subacute bacterial endocarditis with penicillin in this country is at present confined to specified institutions, as announced recently in this *Journal*. That this study should be kept on a research basis is obviously desirable until the best methods have been clearly defined. If those advocated by Loewe are finally accepted, this will always be a major therapeutic undertaking and restricted of necessity to hospitals where the fullest laboratory and other facilities are available. It will be interesting to see whether the ultimate verdict is pronounced in favour of combining the use of heparin with penicillin treatment. Heparin in endocarditis has never found much favour in this country, owing to its undoubted danger, but to judge by Loewe's present results the method of administration he now employs must have overcome this to a large extent.

DIAGNOSIS OF HAEMORRHAGE IN MAN

A few years ago most of us had the idea that collapse from haemorrhage was characterized by a rising pulse rate and, at a slightly later stage, a low blood pressure. This notion seemed to be firmly based on physiological grounds, in that a falling cardiac output would precipitate compensatory sympathetic vasoconstriction and cardio-acceleration through the sino-aortic reflexes. It came as a surprise, therefore, to realize that rapid bleedings in human volunteers up to a litre and over were accompanied by collapse reactions with marked bradycardia, and that these reactions became more frequent with the magnitude of the bleeding.[18-20] These vasovagal reactions have been analysed in detail by Barcroft and his colleagues,[21] who have shown that they are the result of "reflex" vasodilatation in the musculature of the body. The characteristic symptoms preceding and accompanying this fainting reaction include deep sighing respirations, yawning, feeling of heat and sweating, vomiting, waning consciousness, carpo-pedal spasms, and sometimes convulsions. The differential diagnosis of haemorrhage and fainting came to be meaningless. At a still later stage after haemorrhage, when haemodilution and anaemia have made their appearance, Sharpey-Schafer[22] has shown that another cardiovascular state occurs: the pulse is rapid and collapsing in type, while the cardiac output is up to double the normal. This state of affairs is commonly seen in patients admitted to hospital after recurrent gastro-intestinal bleeding, and is compatible with considerable reductions of blood volume.[23]

Three types of clinical picture after haemorrhage have thus been established: (1) the "classical" picture with rapid pulse and low blood pressure; (2) the vasovagal reaction; and (3) the late hyperkinetic phase, when post-haemorrhagic anaemia has developed. These varied reactions raise a host of problems for both the physiologist and the clinician. The vasovagal "reflex" and the high cardiac output with low blood volume cut right across current trends of thought on circulatory regulation based on animal work. The clinician also will have to observe the phenomena of transition between the various stages. Shenkin and his co-workers have made a further contribution to the problem by their careful studies. In the early phase of haemorrhage they subdivided the phenomena into the following three stages: (1) symptom-free at rest with pulse and blood pressure within normal limits, but undue acceleration of pulse on standing up; (2) intolerance of the upright position, which precipitates vasovagal syncope; (3) syncopal attacks with bradycardia even though recumbent. They also observed that when all the lost blood was retransfused 1½ to 2 hours after bleeding the blood pressure was raised 10 or 20 mm. Hg. above the value before bleeding.

All these data are of much interest and importance, and we shall expect soon to be able to see more clearly how the jigsaw puzzle fits together. Most of the experimental work involves acute and rapid bleeding. More work is required on slower rates of bleeding on volunteers, for this may resemble more closely what is usually seen in patients with gastro-intestinal haemorrhage.

ROAD ACCIDENTS

Before the war this country had a quarter of a million road casualties every year, with 6,500 deaths. During the war, although there were far fewer vehicles on the road, the deaths have not been much below this figure. The return of the basic petrol ration, with its threat of an outbreak of mechanically dubious cars and unpractised drivers, is a sharp reminder that something must be done quickly to minimize the dangers of the road. Lord Leathers, Minister of War Transport, writing in the *Practitioner* for April, said that the Government would soon announce some proposals, but that the whole community must make a combined effort. Medical practitioners come into contact with the road problem from several aspects. As the Minister pointed out, they know the suffering and trouble that accidents cause; as motorists they are familiar with the dangers, and they can personally influence many of the motoring public. They have a special responsibility in certifying that applicants for licences to drive public service vehicles are medically fit to do so. No medical examination is imposed on applicants for an ordinary licence, and Dr. Douglas Kerr, writing in the same issue, thinks the present declaration of fitness has little value and that private drivers should be obliged to produce a medical certificate similar to that of a public service vehicle. In this opinion he is supported by Mr. Eric Farmer's researches in accident-proneness. As drivers are not examined after accidents, statistics concerning the responsibility of unfit drivers for accidents are, he says, fallacious. Without some such information medical examiners will continue to work largely in the dark, especially if, as Dr. Hugh Dunlop thinks, most of the "borderline" disabilities, as distinct from the definitely incapacitating ailments, are mental and temperamental. Recklessness, indecision, and lack of road sense are more easily detected

[17] *J. Amer. med. Ass.*, 1945, **127**, 129.
[18] Wallace and Sharpey-Schafer, *Lancet*, 1941, **2**, 393.
[19] Ebert, Stead, and Gibson, *Arch. intern. Med.*, 1941, **68**, 578.
[20] Shenkin, Chency, Govons, Hardy, Fletcher, and Starr, *Amer. J. med. Sci.*, 1944, **208**, 421.
[21] Barcroft, Edholm, McMichael, and Sharpey-Schafer, *Lancet*, 1944, **1**, 489.
[22] *Clin. Sci.*, 1944, **5**, 125.
[23] McMichael, Sharpey-Schafer, Mollison, and Vaughan, *Lancet*, 1943, **1**, 637.

in the police court than in the consulting-room or even at the driving test, but when detected they ought, if serious, to be recognized by disqualification. Drunkenness, according to Prof. Sydney Smith, has been greatly exaggerated as a source of accidents; but alcohol is a potential danger in quantities too small to be appreciable in clinical examination, and in his opinion the problem of the drinking driver would be greatly simplified if the law assumed a driver, as it does in many of the United States, to be "under the influence" if his ability has been lessened in any degree by alcohol. Small improvements in motor-car design (leading, for example, to better braking, vision, comfort, and ventilation), such as Mr. J. F. Bramley and Dr. N. T. Glynn, of Austins, enumerate, will perhaps eliminate more danger than will any revolutionary change; such a change, they say, may be more necessary in the design of the roads. The effects of accidents may be mitigated, as Mr. Charles Noon and Mr. William Gissane show, by extending the provision of blood transfusion and sulphonamide drugs, and by organizing accident centres similar to those which have long proved their value in industry.

As the Minister observed, the most disturbing aspect of the road problem is the high toll it takes of children. Over the decade before the war the figures were improving; but the war brought a setback, and the figure is now about a hundred deaths a month in the age group between 3 and 8 years. Dr. Percy Stocks's figures from the General Register Office[1] show that children did not benefit by the wartime restriction of road traffic, and that their need is especially urgent. Training of children in road sense on the lines suggested by Dr. Muriel Hughes in the *Practitioner* will have to be intensified and greater attention given to protective measures such as guard rails and play centres. The legal attitude to compensation for road accidents ought, in Mr. Harcourt Kitchin's view, to be radically changed, and the compensation and rehabilitation of victims should form part of a communal insurance scheme and not depend on a dilatory and expensive legal tussle between insurance companies. Finally, readers may think that the statistics of road casualties will never have much quantitative meaning until the number of victims are correlated with the number of vehicles on the roads.

THE HORROR CAMP

Accounts in the lay press of German concentration camps and the report of the Parliamentary delegation have confirmed what many people knew years ago—namely, that the Nazis, with cold inhumanity, were systematically torturing and slowly exterminating Jews and political enemies. It is well, therefore, to put on record in this week's *Journal* an account of the conditions in Belsen written by one of the medical men engaged in resuscitating its diseased and starved victims. Apparently only a small proportion of the inmates of Belsen were German Jews. The rest were Jews from the various countries occupied by Germany at the height of her recent expansion. The German policy seems to have been one of complete and utter neglect, so that the inhabitants of the camp, deprived of all care and the common decencies, should die of starvation and disease. The results of this policy are described on page 814 by Dr. W. R. F. Collis, a Dublin physician.

It seems to be established beyond doubt that German doctors gave intravenous infusions of benzol and creosote, and we are informed that the apparent reason for injecting benzol was the induction of a paralysis in the victim which would "justify" sending him or her to the crematorium. When British doctors and nurses subsequently tried to administer casein hydrolysate to the starving wretches they cried out in terrified expectation of being sent to the crematorium. It is very hard indeed for people living in this country to realize this terrible example of man's inhumanity to man, and it requires a mental effort to grasp the enormity of such behaviour in civilized Europe. What is peculiarly distressing is the knowledge that German doctors—presumed to be educated men—should so completely deny the humane tradition of their calling, a tradition laid down by the school of Hippocrates and reaffirmed since then by countless generations of medical men the world over. We should of course not fall into the error of supposing that all German doctors are like the doctors in Belsen. But we should be doing a profound injustice to the thousands upon thousands of tortured Europeans if we too easily forget what has happened. It will be some time before we can look upon German doctors as men imbued with the ideals of medicine common to civilized countries—ideals so magnificently sustained by the British doctors, nurses, medical students, and orderlies now cleansing this Augean stable of Nazi horror.

[1] *British Medical Journal*, April 28, 1945, p. 601.

WARTIME RESEARCH IN DAIRYING

The National Institute for Research in Dairying is one of the research institutes founded by the Board of Agriculture as part of the scheme of agricultural research formulated under the Development and Road Improvement Fund Act, 1909. Reading was chosen as the centre of dairy investigation, and in 1912 the Institute was established at University College, Reading (now the University of Reading). In 1920 it acquired the Shinfield Manor Estate, four miles away. The last annual report issued was for the year Oct. 1, 1939, to Sept. 30, 1940. Two years ago it was decided that the publication of some connected account of the work done during the war years should not be too long delayed, and a report has now been published outlining the research activities in the triennium Oct. 1, 1940, to September 30, 1943. This record shows that much of the time and energy of the staff of the Institute has been given to problems created or intensified by war conditions, the solution of which problems would increase wartime efficiency in production, handling, distribution, or manufacture of milk and milk products. Some of these problems have been solved to the advantage of the country and the dairy industry; some are still under investigation; some wait on fundamental research before a solution can be found. The war has repeatedly underlined the need for fundamental and long-range research in certain directions in dairy science. Experience on the farm in wartime has emphasized that there is still much to be learnt about the breeding, feeding, and management of dairy cows for consistent high yield and quality of milk either when, as now, imported concentrates are scarce or when the supply of feeding stuffs is normal. The events of the war have supported the view, expressed many times in the past by the Institute, that the physiological approach to many problems of dairy husbandry needs greater emphasis both now and in the future. Another need brought to light by wartime conditions is for improving farm dairy appliances and machines. Practical wartime difficulties in the dairy industry have again and again stressed the importance of a wider and more accurate knowledge of the micro-organisms which either enter unasked or are pressed into service at different stages of milk production, handling, and distribution, or in the manufacture of cheese, butter, and dried milk. As the director, Prof. H. D. Kay, says, "Quite fundamental to any system of control or assessment of the marketability of milk or to a steady improvement in the quality of milk reaching the public is objective research in this field of dairy bacteriology . . . the post-war research work of the Institute must be on a larger scale and attain a wider scope than anything conceived before the war."

BELSEN CAMP: A PRELIMINARY REPORT

BY

W. R. F. COLLIS, M.D., F.R.C.P., F.R.C.P.I., D.P.H.

The following extract from an appreciation of the situation by the senior medical officer after 24 hours' contact with the camp will serve to illustrate the state of affairs at the beginning.

GENERAL LAYOUT

"The camp is separated into two distinct portions—Camps 1 and 2. Camp 1 is a hutted encampment housing approximately 22,000 females and 18,000 males. Camp 2 consists of a series of brick buildings and houses approximately 27,000 males. The inhabitants of these camps are of mixed nationalities, with Russians and Poles predominating. Czechs, Belgians, French, and Italians are also present.

CONDITIONS PREVAILING

The following is a brief account of the conditions seen on first entering these camps on April 17, 1945. It is impossible to give an adequate description on paper.

Camp 1.—A dense mass of emaciated apathetic scarecrows huddled together in wooden huts without beds or blankets in many cases, without any clothing whatsoever in some cases. The females in worse condition than the men, their clothing generally, if they have any, only filthy rags. The dead lie all over the camp and in piles outside the blocks of huts which house the worst of the sick and are miscalled hospitals. Approximately 3,000 naked and emaciated corpses in various stages of decomposition are lying about this camp. Sanitation is non-existent. Pits, with, in only a few instances, wooden perch rails are available in totally inadequate numbers, but the majority of inmates, from starvation, apathy, and weakness, defaecate and urinate where they sit or lie, even inside the living huts. There is no running water or electricity. All water is being brought in by our water trucks.

Camp 2.—Conditions in this camp are vastly improved in comparison with Camp 1. The inmates are housed in buildings, 600 to a building of 150 capacity. Sickness in this camp is much less and the death rate is about 10 a day. The inmates appear better clad and generally less emaciated than in Camp 1, though signs of starvation are everywhere. An attempt is being made to bury the dead.

DISEASES PREVALENT

Camp 1.—Riddled with typhus and tuberculosis. Gastro-intestinal infections are very common and are probably enteric and simple gastro-enteritis. No cholera or dysentery has been diagnosed. Erysipelas, scurvy, and starvation disorders are prevalent.

Camp 2.—Enteric, tuberculosis, erysipelas. There is no typhus in this camp."

Actually the state of affairs was worse than described above: for instance, when the corpses were more accurately counted the figure was nearer 8,000 to 10,000 than 3,000. In many cases the dead lay in naked walls of bodies around the huts, many of which were filled, literally filled, with the dead and the dying. Next to nothing had been done for these people for months. For a week they had had almost no water. There they lay, either three persons to a bunk designed to hold one or on the floor, in foul rags drenched in excreta, covered with lice. Death came chiefly through starvation, typhus, tuberculosis, and dysentery: 500 a day were dying from disease, and the guards killing more. In Camp 1, covering an area of 0.8 mile long by 0.4 mile wide and containing a large portion for administration and another for the crematorium and "accessories," were kept 40,000 human beings confined most of the time to the huts on pain of being shot.

Into this foul place came the British troops. The S.S. guards were got under control and forced to bury the dead and clean up the worst of the filth. The Hungarian guards were also employed, and an S O S for help sent out. In the meantime the following British medical units were sent to the camp by the D.D.M.S., Second Army, Brig. H. L. Glyn Hughes, together with a contingent of the armed Forces, including military Government detachments, and began the colossal medical task of transforming a death-trap into a hospital, though it could not be regarded as a commitment which came strictly under the Army Medical Services, but the dictates of humanity required quick action: 32 C.C.S. (Lieut.-Col. J. A. D. Johnston, R.A.M.C.); 11 Light Field Ambulance (Lieut.-Col. M. W. Gonin, R.A.M.C.); 163 Field Ambulance (Lieut.-Col. M. E. M. Herford, D.S.O., R.A.M.C.); 30 Field Hygiene Section (Major P. J. Fox, R.A.M.C.); 76 Field Hygiene Section (Major F. R. Waldron, R.A.M.C.). Some days later these were reinforced by No. 9 General Hospital—600 beds (Col. A. R. Oram), and these have been followed up by another C.C.S. and another general hospital of 1,200 beds.

The work carried out by these medical units under the direction of the S.M.O. Camp, Lieut.-Col. Johnston, produced results which have to be seen to be believed. The setting up of hospital accommodation of 17,000 beds in ordinary barrack buildings is one of the monumental tasks undertaken and accomplished. Beds, bedding, drugs, dressings, and a hundred and one other items of hospital equipment had to be found from one source or another, whilst nursing and domestic aid on a large scale had to be recruited and organized from among those internees capable of rendering assistance, and also from German sources. Only the superb initiative and untiring energy displayed by Lieut.-Col. Johnston made this feat possible. The Field Hygiene Section were meanwhile tackling the problems in hygiene which abounded in this camp of horror. Supervision of the clearing away of corpses and filth, with which the camp area was literally covered, and the disinfestation by D.D.T. powder of the 40,000 inmates of the camp were among the manifold duties which fell to their lot in the struggle to control infection and prevent its spread. The antityphus measures undertaken were directed and controlled by Capt. W. A. Davis, U.S.A. Medical Corps (Consultant in Typhus attached to 21st Army Group from the U.S.A. Typhus Commission). The work carried out by the Field Hygiene Sections and Capt. Davis has undoubtedly resulted in preventing a widespread epidemic of typhus.

About a week after the camp was uncovered a contingent of the British Red Cross arrived and were immediately thrown into the fray, doing anything and everything that they were asked. The women, under the leadership of Sisters Silver-Jones and Beardwell, were sent into the hospital area to take care of the first 600 patients admitted, most of whom were in a dying condition, covered with suppurating sores and almost all suffering from dysentery and many from typhus. The men took on the job of driving the now patients from the horror camp to the human laundry and then to the hospital. About two weeks later 100 medical students arrived and, under the direction of Dr. Meiklejohn, of U.N.R.R.A., took over the major job of feeding the internees in the horror camp. The stench, the foulness, which these young men endured is quite impossible to describe. Gradually the huts were got into order and the patients thinned out, partly by removal and partly by death, and the camp was divided into two areas—one known as the Horror Camp Hospital, in which treatment of a medical nature is now being undertaken. In those huts outside the Horror Camp Hospital one or two students with 0 to 5 internee nurses look after 200 to 400 people who have not been medically sorted out. In the huts of the hospital area of the Horror Camp (Camp 1) three medical students look after some 150 patients, assisted by internee nurses and Hungarian guards. In a small division of a hut containing 8 to 10 patients may be found two cases of typhus, one or two cases of advanced tuberculosis, and three with dysentery. The complications most often met with in the typhus patients are thrombosis, gangrene, and bronchopneumonia. Cerebral symptoms are rare and usually fatal. Among the pure famine cases are many with oedema, gingivitis, pigmentation (? pellagra), emaciation, and profound lassitude. These medical students have done and are doing a work of epic gallantry and are worthy of all honour.

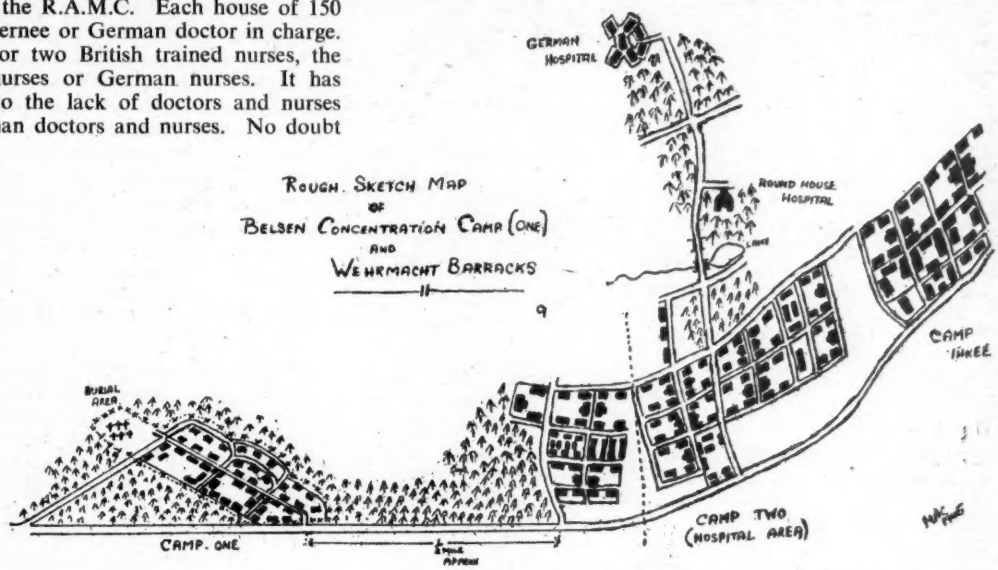
The daily death rate in the camp, which was approximately 300, fell very shortly after the arrival of the students and is now approximately 60. There is no doubt that the provision of 40 tons of dried milk and of the necessary protein hydrolysate and glucose, and the supervision of the special feeding, have resulted in the saving of thousands of lives.

The accompanying map gives the general layout of the camp as it now exists.

Camp 1 (the Horror Camp) is now practically empty. A day or two should see the last of the inmates cleared from the ordinary huts to either No. 1 Camp Hospital or to the hospital proper. The Horror Camp will then be burned.

Camp 2.—Part of this camp is now under the control of an Army General Hospital, with already nearly 2,300 patients. It

is rapidly expanding to 3,500. The larger portion of Camp 2 is still under the control of the original C.C.S. and consists of the main hospital area, containing 11,200 patients. It is divided into squares of five houses, the whole square accommodating approximately 700 patients. Each square is under the control of one medical officer from the R.A.M.C. Each house of 150 patients has one Swiss or internee or German doctor in charge. Each square has only one or two British trained nurses, the rest being either internee nurses or German nurses. It has been found necessary due to the lack of doctors and nurses from home to employ German doctors and nurses. No doubt the additional medical skill thus added have proved beneficial in a general sense, but the patients are naturally terrified of being looked after by Germans even under supervision, remembering how they were tortured in the past. It has been established that patients were often given intravenous infusions of benzol and creosote by the German *medical* staff, so that now, when the doctors approach with hydrolysate for intravenous infusion, the patients often cry out begging not to be taken to the crematorium. The main squares (see map) are for general treatment, while the three blocks at the back are kept for maternity patients and children. Probably nowhere else in the world at the present moment, certainly in no maternity hospital, have obstetricians to deliver women who are actually suffering from typhus at the time of their confinement, but here this is quite ordinary. The difficulties facing the staff have been truly appalling, but now very few women are getting puerperal sepsis, though many of the babies are still going down with neonatal sepsis.



The Children's Blocks are the happiest in the whole camp. Many of the children are emaciated, showing the utmost marasmus, and many are sick; but also many are now beginning to recover, and, strange though it may seem, these, particularly the children under 7, do not show the terror symptoms which are perhaps the most terrible aspect of the adult patients' mental state. Already they are laughing and smiling again. Many are going to recover altogether. But our responsibility will not end then, for most have no homes to go to, no parents, no ordinary future. Surely somewhere in the world there are people who will come forward and care for these children and give them a home again.

In the general squares of the hospital area the main treatment up to the present has been that of feeding those in the extreme famine condition. Dr. Janet Vaughan and her team are doing invaluable work with intravenous hydrolysate while making important scientific investigations; but it is not easy to give an intravenous infusion with one hand and a bed-pan with the other, and little can be expected from these specific treatments. Few of the important scientific problems can be tackled properly until sufficient nursing facilities can be obtained.

In the hospital area it is still necessary to nurse patients with open tuberculosis and typhus in the small overcrowded wards containing other patients. Without *x*-ray apparatus diagnosis is often only provisional.

Camp 3.—This area contains approximately 8,000 persons. They are supposedly well or at least convalescent and have been transferred from the other camps. They are able to walk and generally able to look after themselves; but many are pitiably weak still, and now quite a number are getting sick and being transferred back to the hospital once more. Typhus has broken out now in Camp 3 quite seriously, and the problem of the management of this vast collection of persons from the social and medical points of view is one of the most difficult facing the directors of the camp.

If the map is referred to again two other hospitals will be seen—the Round House Hospital and the German Hospital. These have not yet been opened, though over 1,200 German patients have been removed from the latter, and it is now being got ready for admission of the patients from the camp. One wing is at present being used for the treatment of a number of orderlies and R.A.M.C. personnel who have themselves contracted typhus in the course of their duty. The opening of these new hospitals will greatly help the more advanced types of medical and surgical therapy.

Finally comes the immense problem of rehabilitation of these poor, abused, broken people. First the demands of their bodies must no doubt be met, but many are as wasted in mind as they are in body. Here expert workers are necessary, and vast quantities of books in all languages—Russian, Polish, Yugoslavian, German, and French, together with all kinds of sewing equipment, such as needles, thread, thimbles, etc., for the women; and much besides. The number of French internees cannot be more than 200, and all whom one speaks to who are recovering are full of hope and thinking only of the day of their return to France; but many thousands of those from the East, particularly the Poles, have no homes to go to, have apparently no future, no hope. The problem of what to do with these forsaken, almost lost, souls is immense, but one which if not tackled and solved will make all our efforts here mere waste of time, for then it were kinder to have let them die than to have brought them back to mere existence and more suffering in a hostile world where they have no longer even a hope of being able to compete in the struggle of the survival of the fittest, and must inevitably go down.

Conclusion

This is a brief preliminary report of Belsen Camp to give the medical profession in Britain some idea of the medical problems involved. It is a complete understatement. No words can describe the stench of decaying faeces, rotting bodies, and burning rags, which in the first weeks one could begin to smell miles from the camp, and it can but be left to the imagination of the medical men who read this article to appreciate what the doctors, nurses, and students at Belsen have endured and accomplished.

Since the camp was taken over from the Germans more than 20,000 internees have been buried; some 30,000 are left, of whom 11,200 are in the main hospital area. Now the Horror Camp is being rapidly emptied and the first emergency problem of hospitalization at Belsen has been accomplished, though an enormous task lies ahead if these poor people are to be cured and rehabilitated. It will be possible to repatriate those who are fit to be moved to their own countries, where further hospitalization and rehabilitation will be a matter for their respective peoples; but there will still remain a very large number, possibly thousands, of Stateless and homeless people whose welfare, both medical and general, and ultimate assimilation into normal society must remain as an almost insoluble problem for years to come.

All honour is due to the R.A.M.C. and the doctors, nurses, and medical students of the British Red Cross and Order of St. John, under whose umbrella a large number of people of different nationalities have worked in perfect harmony. Particular mention must be made of the Swiss doctors and nurses who arrived by air and immediately went straight into action in the traditional manner of their countrymen whenever the cause of humanity is to be served. Nor must the gallant efforts of the internee doctors and nurses be forgotten. Many were sick and weak themselves, but, forgetting their tired and wasted bodies, they have worked and fought beside our medical personnel to their utmost power. Finally, the part played by the orderlies and other British soldiers must also be remembered. Their courage and kindliness were amazing, and not a few of them now lie dangerously ill, having contracted typhus while cleaning up the filth and helping the lice-covered patients.

THE TASKS OF U.N.R.R.A.

MEDICAL SERVICES IN LIBERATED COUNTRIES

Dr. Andrew Topping, chief of the Health Division of the European Regional Office of the United Nations Relief and Rehabilitation Administration (U.N.R.R.A.), Col. R. E. Butler, its chief nutrition expert in the Balkans, and other members of the Health Division staff have lately returned from visits to certain of the liberated areas of Europe. They recently met representatives of the medical press in conference, when some very candid and enlightening statements were made.

Difficulties of the Administration

Dr. Topping said that the original programme of U.N.R.R.A. was framed on the supposition that it would play an important part in the reorganization of medical services throughout the liberated countries, but it was not appreciated that for this purpose certain essential priorities must be secured and support given at the highest level by the subscribing Governments. U.N.R.R.A. had not been able to obtain these priorities, with the supplies, shipping, and man-power necessary for its elaborate programme. Many Governments had been extremely half-hearted. Statements had been current that U.N.R.R.A. was not doing its job, but no one had explained that it was not its province to relieve liberated countries during the active military period when the various armies engaged were supposed to be dealing with civil problems. The problem of transport and supply so far as the civil populations were concerned had proved impossible for the armies, whose prime aim had obviously to be the successful prosecution of the war, but this fact should have been stated and the slur upon U.N.R.R.A. removed.

The Administration, Dr. Topping further explained, had had to cope with a severe shortage of medical and nursing services. One of the sections in its constitution provided that subscribing Governments should release any in their employment who were considered essential for U.N.R.R.A.'s activities; but in fact, while many local authorities deserved praise for releasing temporarily some of their key personnel, considerable difficulties had been found in obtaining the people who were wanted. It had also been expected that the liberated countries of Europe would require expert help in the reorganization of their medical services, and in fact a senior health officer had been appointed to each country; but while these officers had been courteously received and friendly relations had been established, and their help in enabling supplies had been appreciated, they had been given no specific functions in the reorganization, and their presence was, to put it bluntly, looked upon as the price to be paid for essential medical supplies.

The European Picture

Concerning the conditions in France and Belgium, Dr. Topping said that in many respects they were not as bad as they had been represented. It had been stated that there was great shortage of doctors in Belgium, but in fact doctors there were in adequate supply, and indeed a number had been recruited by U.N.R.R.A. with the full co-operation of the Ministry of Health. The position in Holland was considerably worse than elsewhere, and in Greece the position was serious, largely owing to a lack of appreciation by the Government of the need for sufficient medical and nursing services. Italy also was not getting an adequate diet, but in this respect it was little worse off than before the war. The future of these countries from this point of view depended upon forces stronger than U.N.R.R.A., chiefly upon the resources available for overcoming world food shortage.

As for countries within the Russian sphere of influence, Dr. Topping said that a mission had been ready to go to Poland and Czechoslovakia for many months, but so far it had been impossible to obtain permission. Although a mission had now entered Yugoslavia, it appeared that the authorities there looked upon the presence of U.N.R.R.A. personnel as little more than a nuisance and were not according them reasonable facilities. Yugoslavia had asked for a team of plastic surgeons, complete with anaesthetists, dentists, and nurses, and U.N.R.R.A. is investigating the possibility of meeting their wishes.

Solid Achievements

Nevertheless, U.N.R.R.A. has some great achievements to its credit. Dr. Topping mentioned the organization of very large camps in the Middle East and North Africa. At one time there were more than 60,000 refugees under the Administration's control, but these were gradually being sent back to their own countries. Another achievement was the establishment of friendly relations with the medical profession in the various countries. Concerning the control of displaced persons in Germany, U.N.R.R.A. had undertaken to provide 450 teams, each with doctor and nurse, and 205 were in the field already, working under military control. A good deal of difficulty had been experienced in getting together these teams, for it was possible only to get older people or the medically unfit and those who could be spared from their ordinary jobs. The recruiting net had been cast very wide. A number of doctors had been recruited from France, Belgium, Poland, and Czechoslovakia, and it was hoped to obtain others from Eire, Switzerland, and Sweden, and from Austrian refugees in this country.

Dr. Topping added that Sweden had been very helpful in offering to take 10,000 displaced persons, sick people, and children. The country had already received 20,000 people from Germany, mostly Norwegian and Danes. The difficulty would be the hard core of people, expected to number at least half a million, who had no country.

The Extent of Malnutrition

Prof. V. P. SYDENSTRICKER, the American nutritional expert, told the conference that in Paris and Brussels, although there was hunger and misery, there was no serious state of starvation. In Western Holland, the portion of the country liberated early in May, actual starvation did prevail, and the ration had fallen to an extremely low level. Loss of weight was found to a significant degree in the town populations, and in the poor districts of towns where close observations had been made 10% of the people were suffering from famine oedema. Lists of these people had been prepared, and they were visited by officials and given extra food when it was available, and the Dutch were prepared to carry their own relief as soon as supplies appeared. He also spoke of experiences with protein hydrolysate. Small experiments he had carried out personally had been successful, and in Holland the first reports were excellent. He had been told that at Belsen the experiment was not successful, the people suspecting a new form of torture. It was only when people were too ill to take milk and gruel that protein hydrolysate was used.

Col. R. E. BUTLER spoke of his experiences in the camps, mainly for Yugoslavs and Greeks, in the Near and Middle East. While there were minor deficiencies, by and large the children were in good condition. In Greece itself the picture was now different from what it was in 1940–1. The growth of the black market, to thwart the German authorities, and the advent of the Swedish–Swiss Red Cross, had resulted in a marked improvement in nutritional standards. In the hospitals, among the many patients brought in for injuries, there were few who exhibited any marked degree of malnutrition. Thanks to the Red Cross, the situation was in control in Athens and Salonika. He had seen no cases of famine oedema in Greece, though it was reported that the children were under weight. In Italy

minor deficiencies were apparent, but the age-weight figures had not been seriously disturbed. If supplies were continued as already allocated, no grave position should arise.

Infant Welfare and Epidemiological Work

Prof. R. R. STRUTHERS, of McGill University, a paediatrician attached to U.N.R.R.A., added some observations on his recent visit to France and Belgium. He said that children in the age group 1–3 years had been well provided for; the neonatal death rate was not much higher than before the war. The frequency of miscarriage was rather higher than normal, but nothing like it was in 1941–2. Breast-feeding of infants was not carried on for as long a period as usual, but this might be due to the desire of the mothers to get back to their factory employment. The birth weights of infants were comparable with the pre-war figures. In Holland the children looked comparatively well, but lean. The only place where he had encountered acute difficulty was in the South of France, along the Mediterranean coast, where supplies of food and milk were inadequate.

Dr. N. M. GOODMAN gave some account of the new international conventions sponsored by U.N.R.R.A. at the time when the International Office of Public Health in Paris was under German occupation. U.N.R.R.A. received and dispatched as quickly as possible epidemiological information and had set up bureaux in London and Washington, the former to deal with notifications from Europe, the Middle and Near East, and Africa, and the latter with notifications from the Americas and the Far East. Among the other duties of the Administration was to authorize yellow fever vaccines to be recognized internationally, and with the consent of the French Minister for the Colonies, tests were to be made on French soldiers going to the Far East. It was a new departure in medicine that an international body should be authorized to test and approve vaccines and the institutes at which they were made.

EMERGENCY RATIONS FOR POLAR FLIGHTS

For the Polar flights made by the R.A.F. Lancaster *Aries* it was decided that in case of a forced landing in the Arctic regions the aircraft should carry emergency rations for the crew of nine sufficient to last 28 days. These were designed and prepared by the Low Temperature Research Station of the Department of Scientific and Industrial Research, in close consultation with Wing Comdr. Macrae, of the R.A.F. Institute of Pathology, and Wing Comdr. Winfield, of the R.A.F. Institute of Aviation Medicine, who was the medical officer on the flights. For this purpose the normal rations available were not altogether satisfactory, as they would have been too weighty and bulky. Thus the use of dehydrated foodstuffs was indicated, and, in view of our development of compounded food tablets, an approach was made by the Air Force authorities with a view to a ration being specially made for the job in the Low Temperature Research Station.

Compounded Dehydrated Foods

If the aircraft was forced down there was a good possibility that some of the aviation spirit could be salvaged. A stove had been designed to burn 100 octane spirit, and its use for cooking and for melting snow and ice to reconstitute dehydrated food was possible. Clearly the amount of fuel available was not unlimited, and the ration had to be so designed to use it economically, and in case no fuel was saved a substantial proportion of it could be eaten dry and be palatable in that form.

The ration pack was designed so that most of the food was in the form of blocks of compounded dehydrated foods. These consist of mixtures of dehydrated foods with added sweetening and flavouring materials where appropriate, so that each is a ready-made meal requiring only the addition of water. They are fabricated into tablets of standard size (usually 2 in. by 2 in. by 0.9 in.). Two of their virtues are that they need only to be wrapped in high-grade waxed films or papers and that their standard size facilitates the assembly of mixed rations, while very little space is wasted as compared with circular cans. One of two processes is employed. Tablets containing dried foods of large particle size such as dehydrated meat or vegetables are made by compressing the mixture in a hydraulic press. The pressed block can be crumbled easily in the hand and reconstituted, when any lumps are broken up by the swelling of the larger particles. Where the particle size of the material is much finer, as with spray dried powders such as milk or egg, compressed blocks of this kind would be very difficult to crumble, and, furthermore, lumps escaping crumbling would remain as unreconstituted lumps and mar the smoothness of the product. Thus they are prepared by casting the mixture hot into moulds with added molten fat. The fat binds the particles when cold, and the block can be dissolved by adding it to the boiling water. The heat of the water melts the fat and the enclosed particles of food go into solution without any lumps being formed. The texture of these blocks is such that many of those containing milk powders are palatable when eaten as sweets.

Menus for Four Days

A sufficient range of these blocks had been developed and tested to enable four different menus to be prepared to relieve the monotony of the diet. Just as everyone eats bread and drinks tea every day, so some items were included each day or on more than one day in the four, but it is thought that the variety was as great as in a normal wartime household menu. The possibility of increasing the number of varieties still further was rejected as it would have complicated the job of production. The menus finally agreed upon were:

	Day 1	Day 2	Day 3	Day 4
Breakfast	Porridge Toasted cheese Biscuits Butter Milk	Porridge Scrambled egg Biscuits Butter Cocoa	Porridge Herring Biscuits Dripping spread Milk	Porridge Scrambled egg Biscuits Dripping spread Cocoa
Mid morning	Tea	Tea	Tea	Tea
Lunch	Meat & vegetable stew Fruit Biscuits Butter Tea	Cod pie Biscuits Butter Cheese Coffee	Meat & vegetable stew Semolina pudding Biscuits Dripping spread Tea	Curry Biscuits Dripping spread Cheese Milk
Supper	Meat soup Beef & tomato Mashed potato Cocoa	Beef Mashed potato Fruit Tea	Tomato soup Mutton and onion Mashed potato Cocoa	Beef Potato Semolina pudding Tea
Snacks	Boiled sweets Chocolate	Boiled sweets Raisin chocolate	Boiled sweets Chocolate	Boiled sweets Raisin chocolate
Total calories per man	3,430	3,380	3,400	3,550
Total weight of food per man	708 g.	705 g.	715 g.	706 g.
Total weight of fat per man	185 g.	184 g.	177 g.	213 g.
% fat	26 g.	26 g.	25 g.	30 g.

The computed total weight on this basis was 393 lb. plus 3 lb. for immediate wrappings of the blocks. It was found that rations for two days could be packed into a standard 4-gallon can which not only was most convenient as a master container but also could be gas-packed to ensure that the food remained in the best condition possible. The fourteen cans increased the total weight to 435 lb.

Assembly and Labelling

To simplify unpacking and utilization and to reduce the amount of labelling the 7 or 9 blocks of each item required for one day were held together by adhesive tape in a vertical stack. The stacks were quite rigid, and thus often, where there was space between them and the side of the can, a single block or a biscuit was inserted as a key, thus avoiding the need to fill the whole space with packing. These stacks of blocks were assembled and labelled before the packing of the cans began, and this procedure made the packing operation much simpler—the whole ration laid out on the laboratory bench was quite an impressive sight, though it was difficult to realize that it represented rations for 252 people for one day.

The weight of 715 g. achieved in practice includes, in addition to water and roughage, some 8 g. of salt and 13 g. of tea. It is therefore considered that, for a ration which gives three normal meals a day, it would be virtually impossible, with the materials available at present, to reduce the weight of the ration further. The tinplate cans used and the immediate wrappings contributed some 40 lb. to a total of 435 lb. gross, but this is very modest compared with most emergency rations, even when master containers are excluded. The robustness of the package and the fact that it could be gas-packed were advantages which more than counterbalanced the extra weight. The only other possibility would seem to be in the use of light metal alloys for such a purpose.

These types of food may be of great value for future polar expeditions.

Reports of Societies

PHYSIOLOGY AND TREATMENT OF STARVATION

EXPERIENCES IN WAR-STARVED EUROPE

A meeting of the Section of Medicine of the Royal Society of Medicine was held on May 29, under the chairmanship of Dr. GEOFFREY EVANS, for a discussion on the treatment of starvation conditions, and in particular on the use of protein hydrolysate. The discussion was preceded by the projection of Ministry of Information films depicting conditions in the German concentration camps.

Physiological Basis of Starvation Symptoms

Dr. H. E. MAGEE (Ministry of Health) said that between 1927 and 1933 he was engaged in studying the functions of the alimentary canal, particularly absorption by the small intestine, in animals. Absorption was fundamental to all the other nutritional processes. Failure in absorption was the essential lesion in starvation. Evidence pointed to progressive decline in the efficiency of absorption with increase of fasting period. Many experiments proved that deprivation of food, so far from increasing the functional efficiency of the epithelium of the small intestine, actually diminished it, also that the metabolic functions of the body were slowed by fasting. The small intestine was the great portal of entry of nutrients into the body, and if the essential cells of this viscus were destroyed, as in extreme starvation, the administration of food acted merely as an irritant, causing diarrhoea and dehydration. The aim must be the restoration of structure and function of the intestinal epithelium, and as this could not be done by giving food by mouth, suitable "building stones" must be given by vein. Enough glucose must be given, preferably before the proteins, to cover the body's energy needs so as to prevent the amino-acids administered from being used up for energy purposes. Sufficient B vitamins must also be administered to cover oxidation of glucose.

Loss of the protective function of the epithelium laid the intestine open to infection by organisms present in the food, and would explain the presence of ulcers so frequently found in persons dying of starvation. The work of Elman and others in the United States had shown that suitable hydrolysates could be used in the treatment of starvation arising out of pathological conditions which prevented the consumption, digestion, or absorption of food administered in the ordinary way. Dr. Magee had felt that this method of treatment would be of inestimable benefit to people suffering from acute starvation, though at the time this work was brought to his notice (1943) he had not contemplated the possibility of cases of starvation requiring such treatment coming to this country. He added that the Ministry of Health had set up emergency supplies of hydrolysate in Whitehall and in the regional offices for immediate use.

Conditions in the Channel Islands

Dr. Magee, who had just returned from the Channel Islands, said that there he saw two cases of extreme emaciation in adults, and these, with another case, had been evacuated to this country. He also saw a number of other adults, including German prisoners, in varying stages of recovery from nutritional oedema and emaciation. The history in all these cases was the same. As the diet became more vegetarian, and therefore more bulky and fibrous, the patients became increasingly unable to eat food of any sort, oedema set in, and then persistent diarrhoea and vomiting. In the more severe cases even milk was not tolerated. In some cases which came to operation or necropsy, volvulus of the caecum was found, with spastic contractions of the transverse colon, and ballooning of the part proximal to it. The large and, more rarely, the small intestine were thinned out to an extreme degree, and seemed to consist mainly of the serous coat. Ulcers of the large intestine were also sometimes seen.

The surgeons on the Islands had informed him that at first the perforation of peptic ulcers was relatively common, and subinvolution of the uterus had been frequent during the occupation. They also said that the incidence of appendicitis was much lower during the occupation than before it. Since the liberation the bulk of the people had been suffering from constipation, sometimes very obstinate, and the whole medical profession in the Islands deplored the return to white bread.

Preparation of Hydrolysates

Dr. P. CUTHBERTSON (Medical Research Council) said that in planning to treat cases of starvation it was urgent that adequate protein intake should be available, or, if the ability of the body to break down protein into its constituent parts were lacking, as in advanced cases of starvation, that the constituent amino-acids should be at hand. Dr. Magee had stressed the changes in the columnar epithelium in fasting, and it was to be supposed that the enzymes suffered a similar change, though this was not quite established, and even in the most advanced stages of starvation it was still possible to get patients to sip proteinaceous fluids and to obtain some protein synthesis.

Interest in protein hydrolysates dated from 1913, when Henriques and Anderson carried out some experiments on goats, injecting into the vein of the goat a hydrolysate formed by a pancreatic extract of goat flesh, as a result of which nitrogen equilibrium was achieved. Amino-acids given in the form of hydrolysates brought about a positive nitrogen balance. He mentioned various methods by which hydrolysis could be induced in proteins: (1) Proteolytic enzymes of pork pancreas; here the longer the digestion went on the greater the proportion of amino-acids. (2) Papain, a proteolytic enzyme from the melon tree; digestion at 50° C. was rapid. (3) The acid H_2SO_4, splitting the protein into amino-acids, but in the course of this development tryptophan was lost. Casein hydrolysis had also been used; its great drawback was unpalatability.

Dr. Cuthbertson demonstrated the sets as made up by the Protein Requirements Committee of the M.R.C. Each set included, besides instructions and records, ten bottles of 5% hydrolysate, one tin of glucose–vitamin mixture, five bottles of plasma and serum (dried), and five bottles of 10% glucose in pyrogen-free water. These packages were meant for the treatment of patients too ill to sip fluids by mouth. The idea was that the glucose–vitamin mixture should be given by gavage (drip nasal feed) and the protein hydrolysate by vein. By the evening of the third day it was thought that the patients would be got on to skim milk plus glucose by mouth. The plasma had proved to have considerable value; it increased the osmotic properties of the blood, and perhaps reduced the hunger oedema. On the other hand, if there was a considerable demand by the tissues for protein, that protein might be rapidly used up. In addition to the intravenous sets, units were being put up for 16 complete treatments, providing 50 grammes of hydrolysate and 50 grammes of glucose.

A Complex Picture of Many Unknowns

Dr. HUGH S. STANNUS said that protein hydrolysates had sprung rather suddenly into prominence, and might attain the unenviable position of being regarded as a cure for all ill. Associated with extreme emaciation was a marked loss of protein in the tissues, and to save life the first essential was to restore protein. The giving of protein hydrolysates was only one among other methods which might be used to attain this end. From 20 to 30 different amino-acids had been isolated from animal and plant proteins; 8 to 10 were essential to human needs. Combinations of these amino-acids, in different order or amount, with some omitted and others added, made an almost infinite number of different proteins possible. It had been estimated that there were 1,600 types of protein in the body of man. The amino-acids were the stones or bricks with which each cell built its own structure.

The conditions in starvation, to meet which protein hydrolysate therapy had been introduced, made a complex picture of many unknowns. If the patient could swallow, digest, and absorb the requisite amount of protein this might be supplied in some suitable form such as reconstituted dried skim-milk powder by mouth, or, if he could not swallow, by nasal-tube feeding; but if he were unable to digest, then protein hydrolysate should be given by mouth or by gavage, and if he could

not swallow or digest or absorb, then resort must be made to intravenous administration of protein hydrolysate.

This conception, however, had been rather shaken in his own experience when called upon to advise upon the treatment of a repatriated prisoner of war who was in the last stages of starvation, with an extreme degree of emaciation and dehydration, and regarded by his R.M.O. as unlikely to live another day. He had also a Flexner infection, and the diarrhoea persisted in spite of sulphaguanidine. He had difficulty in taking his milk diet. It seemed to be a case demanding intravenous hydrolysates, but none were available, and the man was therefore given glucose-saline intravenous therapy, a crude liver extract parenterally, and teaspoonful feeding with powdered liver substituted for the milk diet. The response was dramatic, and a second case responded in a similar manner.

Among the considerable number of returned prisoners of war detained in hospital whom Dr. Stannus had had the opportunity of examining, the signs suggestive of protein deficiency had been almost universal. Many showed, in addition, all kinds of signs combined into mixed syndromes recognizable as indicative of vitamin deficiency—conjunctivitis, cheilosis, annular stomatitis, glossitis, change in the hair, paraesthesia, acrocyanosis, altered reflexes, "crazy pavement" skin, and pellagrous eruptions. Anaemia was common in some of the megalocytic type.

Conditions at Belsen Concentration Camp

Dr. JANET VAUGHAN, who was one of a small team of workers sent out at the end of April by the Medical Research Council to test the relative value of hydrolysates, skimmed milk, and serum in the treatment of starvation, gave a moving account of the conditions she found at Belsen camp. She first paid a tribute to the R.A.M.C. personnel. The amazing courage and gallantry of those who first went in to tackle what must have been one of the worst medical problems that had ever been put up to anyone deserved high praise. There were on the field at the beginning a field ambulance, a casualty clearing station, and a mobile pathological laboratory to deal with literally thousands of starving and dying persons, and the way in which they rose to the occasion was unbelievable. She herself and her colleagues arrived late in the day, after the first fortnight, and she would always feel it a great privilege to have seen what courage and kindliness could do in face of such difficulties.

The problem was a twofold one: to determine whether the hydrolysates worked, and whether they were practicable. The answer to both questions was quite definitely in the negative under the conditions found in the concentration camp. They had compared the administration of amigen, an acid hydrolysate, by intravenous injection; serum given in normal concentration and twice concentrated (because it was found that at the prescribed dose they could keep no one at a positive nitrogen balance; hydrolysate used orally, both in the standard dose of 50 grammes daily and in the double dose: and a milk mixture in the standard dose of 120 grammes daily.

Laboratory conditions were good, but hospital conditions most primitive. The hospital was a German barracks, in a filthy condition, furnished with wooden beds and straw pallets. Each floor had about 100 patients. There were two water taps on each floor, but sometimes no cold water for days together. Hot water was obtained by means of a primus stove. During the first week candles were the only artificial light. Nursing at first was done by the less ill women in the camp, who had, of course, no training, and by members of the Hungarian Army, who performed every function under the supervision of one English sister responsible for four big blocks. Food was supplied from big central kitchens under the supervision of one Red Cross worker in each kitchen. Preparation and distribution were relatively primitive, and the feeding of this mass of ill humanity was an extremely complicated problem and made one feel that it would be better to provide the personnel for the distribution of food instead of carrying out elaborate therapy. The people were of all nationalities, with no common language. Patients severely ill were admitted to the number of 700 to 1,000 a day. They went straight to what was called the "human laundry," really the laundry of the barracks, where they were laid on tables and scrubbed by German nurses to remove the caked dirt and faeces of months. She and her colleagues would go to the laundry to pick out cases which they thought would be useful for their purpose. They chose men who were grossly emaciated, too weak to get themselves off the stretcher. A snap diagnosis was made, to avoid patients with tuberculosis or dysentery. All of them had diarrhoea and all had oedema of the feet. Some cases showed gross famine oedema. The pathological facilities did not suffice to cope with 1,000 cases a day, but it was clear that although there was some Flexner dysentery, the majority of the cases gave no micro-organism.

In the group of cases dealt with the haemoglobin level was, on the whole, surprisingly high considering the gross deficiency of the blood. The mean figure for 21 men was 66.5%. This included three very low figures, and one very high figure in a collapsed patient, and eliminating these four abnormals, the mean figure was 69%.

Results with Intravenous Therapy

Dr. Vaughan first described the results with intravenous therapy. Five patients were given amigen; they took it well, and had no reaction. Four of them did well; the fifth, with famine oedema, showed no improvement at all. Three patients had oral hydrolysate by intravenous injection; two of them showed no improvement, and the third was very much worse at the end of 2¼ days. This was a boy aged 18, with gross ascites, which became worse under treatment. It was thought essential to raise his plasma protein in the hope of drawing fluid from the tissues, and in the succeeding 24 hours he had two litres of twice concentrated serum, with striking improvement. Three other patients were treated with serum, and all did extremely well. Those with oedema improved, and among those who had had no oedema there was a general sense of well-being and increased facility in moving about.

The workers felt no doubt that if it was possible to use intravenous therapy on a large scale under these conditions serum was preferable to hydrolysates. The theoretical explanation was that with the serum there was much more protein with relatively little fluid. There was danger in pushing fluid into these starved people. A litre of fluid given intravenously, together with whatever they wanted to take by mouth, was probably sufficient. One of the reasons why serum was likely to be more valuable than hydrolysates was because with the latter not enough could be given to bring about a positive balance.

The hydrolysates given by mouth proved to be the worst fiasco of all. The substance had a very unpleasant flavour, and many patients having taken 300 c.cm. curled up and preferred to die rather than take any more. One or two vomited all that they had taken. Two took the whole amount, but with devastating clinical results. One man, who was most co-operative, on the second day of his oral hydrolysate passed at least half a bucketful of watery brown stool and had gross abdominal discomfort. An endeavour was made to give it by nasal drip or oral tube, but the patients regarded this as a new form of torture, and it was difficult to explain to them what it was intended to do.

On the other hand, milk and glucose–vitamin mixture answered extremely well. There were not more than 5% of the patients at Belsen who would not take fluids by mouth. But it was essential to flavour the milk. Many of these patients had sore ulcerated mouths. Mouth washes were out of the question under such conditions, and milk, given for three days with a sore mouth, was not very satisfactory. It was found useful to flavour the milk with tea or coffee, but, of course, other flavourings might be used. Starving people craved not only for food but for familiar food. There was no difficulty in getting them to take milk, and no abdominal discomfort followed, but it had to be given frequently in small feeds, which was very difficult because of lack of nursing staff, and they could not help feeling that it was better to employ nurses to give small frequent feeds by mouth than to set up drips.

Dr. Vaughan added that she was speaking only of hydrolysates in the type of patient whom they had had to handle at Belsen. She did not mean that hydrolysates given perhaps in conjunction with food and under proper nursing conditions might not play a great part in the medicine of the future.

Nitrogen Balance

Capt. J. A. F. STEVENSON, R.C.A.M.C., referred to some nitrogen balance studies undertaken at McGill University. It was the experience of most workers that in the period of increased nitrogen excretion following fractures and burns, if the intake by mouth were increased it resulted in very little change in the nitrogen balance, for as the intake went up the output also went up, so that there was still a negative position. Some workers reported that they could prevent the nitrogen balance from falling by using protein hydrolysate intravenously, and accordingly various amino-acid mixtures were tried out. He exhibited a chart illustrating some experiments with amigen given intravenously to people who were healthy and well-fed but had sustained injury. The results went to show that amino-acids given by vein were treated by the body in exactly the same way as food given by mouth. In the ordinary case there was very little distinction so far as the body was concerned between the results of the two procedures.

The discussion was wound up by a few remarks by Prof. R. B. HAWES, who said that the unhappy circumstances which had made this discussion significant might not be without their value if they taught politicians and others the importance of protein supply. It was Army experience that if there had been a low protein intake in early life, no matter how the men might have developed subsequently, nor how well-fed they might be, these people were the first to show a lowered resistance and to go down with pneumonia or other infection.

Correspondence

Inguinal Hernia

SIR,—Dicey, in the preamble to his famous classic *The Law of the Constitution*, quotes the following remarkable passage written by Burke in 1791:

"Great critics have taught us one essential rule. . . . It is this, that if ever we should find ourselves disposed not to admire those writers or artists, Livy and Virgil for instance, Raphael or Michael Angelo, whom all the learned had admired, not to follow our own fancies, but to study them until we know how and what we ought to admire; and if we cannot arrive at this combination of admiration with knowledge, rather to believe that we are dull, than that the rest of the world has been imposed on. It is as good a rule, at least, with regard to this admired constitution (of England). We ought to understand it according to our measure; and to venerate where we are not able presently to comprehend."

I would commend this passage to Squad. Ldr. J. B. Kinmonth, who, in the *Journal* of May 5 (p. 642), speaks disparagingly of the filigree operation in the treatment of inguinal hernia and also of the results published by Mr. Percival Cole. May I be allowed the courtesy of your columns to give my own experiences in this matter.

Since 1938 I have carried out the filigree repair upon upwards of 80 cases. The filigree technique has been reserved for difficult cases, and the age incidence has been mainly between 40 and 65. Most of the cases have been large inguino-scrotal herniae or herniae of the direct type. Herniae *en glissade* has been present in two instances. The only recurrence I have had has been in a member of the N.F.S. who had been operated upon twice before elsewhere; in this case the recurrence was only slight. Paradoxically speaking, I would welcome a few recurrences, as I am anxious to practise this side of the technique. Apart from this one case, no others have come to hand. Most of the cases have been carefully followed up, and every patient has been asked to report should there be any recurrence. I cannot agree with your correspondent that the recurrences and failures go elsewhere; my experience in other branches of surgery has been that they do come back. In this connexion I well remember a member of the staff of a teaching hospital, who, with characteristic candour, was wont to relate on his ward rounds how he left a patient with a permanent biliary fistula. The patient used to send him a postcard regularly every Christmas informing him that the fistula was working quite nicely. Most of my patients selected for the filigree operation have been in the middle and latter decades of life. The general physique has often been poor to moderate, and the herniae of a type that recurrences could safely be predicted if treated along standard lines. Surgically speaking, my mouth waters when I contemplate a series of herniae in policemen. The recurrence rate on such material, using the filigree technique, should be infinitesimal.

I have in my possession a post-mortem specimen of the right inguinal canal and surrounding structures recently removed from a patient aged 80 years. This specimen demonstrates a filigree repair carried out by McGavin himself 30 years ago. If Squad. Ldr. Kinmonth would care to inspect this specimen and also some of the cases upon which I have operated I am sure that his conversion would be as speedy, dramatic, and complete as was that of St. Paul in another direction many years ago. I would, however, finish on an urgent note. This operation is well within the scope of the average competent surgeon who is conversant with the anatomy of the inguinal canal. This would-be operator should go to the trouble to observe some competent surgeon employing the technique; the haphazard employment of filigrees or their incorrect lodgment might easily lead to recurrences, and bring this magnificent method into disrepute.—I am, etc.,

W. PICKUP GREENWOOD, F.R.C.S.,
Bethnal Green Hospital (L.C.C.), London, E.2. Medical Superintendent.

Surgical Lessons of War applied to Civil Practice

SIR,—In his excellent article on adapting war surgery to civil practice Major-Gen. Ogilvie (May 5, p. 619) raises the issue of control in surgical practice. Regimentation and control may be necessary for efficiency under war and military conditions, but it is open to question whether this is necessary in civilian surgical practice. One of our national characteristics is the power of adaptation and improvisation, and already where the demand has occurred the creation of special units and centres has been established without any external pressure. Centres for cranial surgery have been established, and most reputable hospitals have their own fracture clinics, etc. If this specialization is carried further to any major degree, especially under pressure from any central authority, it will of necessity have a stultifying and inhibiting effect on the periphery.

Surgeons may be "a loose association of individuals," but they hold for the most part higher surgical qualifications and have served a long and arduous apprenticeship. In my own old teaching hospital there was the example of Sir Percy Sargent and Mr. Cyril Nitch, who made brilliant contributions to their own particular fields of specialty, and were equally at home in the field of general surgery. A surgical colleague of mine is as successful with a pneumonectomy as with an endoscopic resection of prostate. British surgery flourishes on account of its sanity, breadth of vision, and sturdy common sense. Coerced into too narrow specialization, we shall tend to become superlative technicians in a limited field, losing that clinical flair for a comprehensive grasp of the patient as a whole being.

The impact of American influence on British medicine must make itself felt. While prepared to absorb much of what is good, it seems unnecessary to adopt entirely their mode of practice with its stress on specialization. British surgery has always been in the vanguard in the past, and its general standard throughout the country, I am sure, compares favourably with and may be even better than, that practised in America and elsewhere.—I am, etc.,

Bournemouth. C. E. P. MARKBY.

Home Helps and Private Nurses

SIR,—I feel that the time has now come to relieve housewives of some of their burdens. In house after house to which one goes one finds nobody able to care for the invalid if the invalid happens to be the housewife herself. We have been promised on some uncertain date in the future a system of home helps, supplied by local authorities who will be able to do housework when required. There is now a most urgent need to start such a service.

Furthermore, in most towns the position as regards private nurses is very unsatisfactory. Before the war a nurse working on her own in a provincial town would, when she first came to the place, call on the doctors asking for their patronage.

Some years later she would vanish, and when one sent round to her address one would be told, "She left here a year ago." Much time was wasted in this way trying to find nurses; in fact most doctors in the Provinces who were at all near London used to phone up a London agency to get one. During the war the medical officer of health of almost every authority employed practically every spare nurse in the district in a first-aid post. Here in Colchester we have an excellent system whereby any private nurses coming to the town are invited to register themselves with the M.O.H., who calls on their services if we phone him up. The nurses, of course, are supposed to keep him notified as to when they are free. This system, if applied to the whole of the country, would be a tremendous advantage.

Finally, a system of hospitals throughout the country where G.P.s can attend their patients who are sick but who do not need specialized treatment is most urgently needed. The E.M.S. was set up to provide hospital services for the public, but in this area it seems to be collapsing. Our local hospital has just had to close 36 beds through lack of nurses, although there are 700 cases on the waiting list. Is the E.M.S. proposing to remain in a state of suspended animation until the National Health Service is inaugurated? For five years the Ministry of Labour has had the power to direct every girl in the kingdom, and now we find ourselves so short of nurses that we have to close down hospital beds. This seems to me a grave reflection on the capabilities of the Ministry of Labour.—I am, etc.,

Colchester. M. E. LAMPARD.

Institutional Maternity Service

SIR,—I am writing to give strong support to Dr. Laura Hutton's letter (May 5, p. 639) on the need for encouraging a home maternity service. I am in full agreement with Dr. Hutton that the happiest and often most satisfactory confinements take place in the patient's own home, but failing the provision of enough domestic service to give peace of mind to the patient I would urge the encouragement of small well-run maternity homes, of which there are many in existence, in spite of their critics. The public demand for these homes is only too evident from the difficulty of obtaining accommodation in them.

In these homes the patient can be attended by her own family practitioner, and in this case the follow-through is complete—ante-natal supervision, the confinement, the care of the nursing mother and newborn infant. To have a break in this continuity from the seventh month until a fortnight after confinement, while the patient is under the care of a doctor unknown to her in an institution, is psychologically unsound. As Dr. Hutton says, hygiene and asepsis are bought at too dear a price in cases where no difficulty is expected.

I also feel that the whole question is of psychological importance to the doctor. It is agreed that the family practitioner is of value to the community, but it is not easy to feel quite the same interest and responsibility in the life of a family when for all the major events such as confinements and operations the patient is compelled (through lack of sufficient alternative accommodation) to go to a hospital, where the general practitioner is only allowed to enter by invitation as a visitor.—I am, etc.,

St. John's Wood, N.W.8. EVELYN MACLAGAN.

Caudal Analgesia: A Rational Assessment

SIR,—As the first folk in Great Britain to have published any experiences of caudal analgesia in obstetrics (*Proc. roy. Soc. Med.*, Oct., 1944, **37**, No. 12, 680) we feel concerned that such a weighty authority in British obstetrics as Prof. F. J. Browne should have thought fit to issue a wholesale condemnation of the method (May 26, p. 746). Backed as we are by a personal experience extending over two years, we cannot allow his armchair criticism to pass unchallenged. To begin with, we question his method of attack, which consists for the most part of having combed the publications on the subject in order to catalogue all the rarest complications and presenting these as reasons against employment of the technique. Surely few procedures in medicine could stand up to so stringent a test: anaesthetics, for instance, would have been given up decades ago had the first anaesthetic deaths been the cause of professional panic.

Let us survey the subject soberly and with an attempt at clear thinking. Caudal analgesia can be subdivided into two categories—that given for a specific obstetric procedure, such as a forceps delivery or Caesarean section, and that given solely for the relief of the pain of a normal labour. The former must be compared and contrasted with other methods of securing anaesthesia for forceps or Caesarean section; the latter, on the other hand, must be compared with alternative techniques for producing adequate analgesia during parturition. All anaesthetics and analgesics for forceps delivery or Caesarean section have definite dangers and recognized complications; so has caudal analgesia. Why condemn the latter, however, and not the former? The alternative techniques for securing analgesia during normal labour also have very definite and recognized disadvantages if given in doses sufficient to maintain *adequate* relief of pain—i.e., they all tend to diminish the force of uterine contractions and slow down labour; they all tend to increase the forceps rate; most of them depress the foetal respiratory centre; and following their use there is an increased likelihood of post-partum haemorrhage. With caudal analgesia the first stage of labour remains unaffected, or, in the highly strung patient who fails to dilate readily, *it is actually speeded up* owing to the paralysis of the motor innervation of the cervix uteri—often in the most dramatic manner. Morphine and other analgesic drugs have killed far more babies than "metycaine" in the sacral canal has ever done, or is likely to do, but do we therefore condemn these drugs out of hand? Our experience is that the foetus is completely unaffected by caudal analgesia, and that cases requiring resuscitation are as few as if delivered without the exhibition of any form of analgesia. We have also found that the uterus expels the placenta in quick time—it retracts eagerly (even before an injection of ergometrine), and that haemorrhage is minimal.

On the question of the increased incidence of forceps delivery it must be admitted that Prof. Browne is on safer ground, but even here he is guilty of an over-simplification of the issue which gives a distorted impression of the facts. Had he pursued his researches into the literature a little further he would have found that all contributors (including ourselves, whom he did not quote) lay emphasis upon the disparity between the behaviour of primigravidae and multiparae upon entering the second stage under caudal analgesia. *It is the former group alone which is responsible for the increased forceps rate;* multiparae nearly all deliver themselves spontaneously. In our previous publication we concluded that caudal analgesia was not suitable for the relief of pain in the second stage in the normal primigravidae because of this increased tendency of forceps delivery. Before condemning the method in primigravidae, however, it is only fair to take into account the increased forceps rate under any form of adequate analgesia; to do otherwise is to think dishonestly or with prejudice. To overcome this disadvantage we are, at the moment, experimenting with a new technique in which caudal analgesia is discontinued during the second stage in primigravidae and an alternative substituted until the head is almost crowned, when caudal analgesia is resumed or gas-and-oxygen given; in this manner the patient has several hours of complete relief from pain and is thus enabled to cope with the second stage without having become half exhausted *en route*. Surely this is an intelligent method of overcoming the difficulty!

Limitations of space prevent all but the briefest comments on the remaining criticisms. To begin with, how many women in the second stage are able to empty their bladders spontaneously? We seem to remember that a full bladder is a well-recognized cause of delay in the second stage of labour, and, when it is, the bladder certainly cannot be voided voluntarily, even in the Garden of Eden! True, there is a small risk of infection during caudal analgesia, but there is also a risk of pneumonia from inhaling vomit during gas-and-oxygen analgesia; yet, again, no one dreams of condemning gas-and-oxygen on this account. There is some risk of infection even at the sight of injection in doing Caesarean sections under local analgesia. When cases of Caesarean section are quoted with lowered blood pressures of 60/40 for periods up to 3/4 hour we can only ask why on earth the patient was not given an injection of pholedrine ("veritol"), or "neo-synephrin," either intravenously or intramuscularly—the latter no more difficult to give than ergometrine. Incidentally this fall in blood pressure

is the only way in which the foetus can possibly be affected by caudal analgesia; and Hingson and Edwards take blood pressures every 1/4 hour as a precautionary measure. They also test the height of skin analgesia at the same time, which should never be allowed to reach higher than the umbilicus; under these conditions a fall of blood pressure is unlikely or, if present, is immediately remediable.

Prof. Browne has endeavoured to divorce the method *per se* from the skill and judgment of those administering it, an impossible procedure when discussing medical technique or treatments. He claims—quite rightly—that the "ideal analgesia in childbirth should be safe for mother and child." But how would he define the word "safe"? If by safe he means foolproof then his condemnation of caudal analgesia is justified and reasonable; but then no method of analgesia is foolproof (again, has he never heard of a foetal fatality following the use of morphine analgesia?), and to be consistent he should eschew all forms of analgesia, a policy to which we can hardly believe he would subscribe. If, however, by safe he means relatively safe then he automatically implies some degree of judgment and skill on the part of the administrator—judgment to pursue, modify, or even withhold the method according to the exigencies of the circumstances and skill to avoid its complications. It is on this very degree of skill and judgment that the safety or otherwise of the method depends; neither can be gained without personal experience, nor can any criticism carry full weight unless the critic is himself personally acquainted with the method under discussion.—We are, etc.,

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Women in Labour

SIR,—This correspondence shows a healthy sign of an awakening conscience that all is far from well in the conduct of our confinements. It is somewhat startling that almost a century after the introduction of chloroform—still an excellent drug—despite the startling advances in the art of anaesthesia in recent years, the over-all standard of analgesia and anaesthesia in labour should be so pitifully low. It would even appear that a lazy acceptance of the "curse of Eve" blinds us to the suffering of a woman in labour, but not if she requires incision of an abscess or extraction of a tooth.

It is also a disturbing thought that in other aspects of midwifery there should be a similar tardy and reluctant attitude to avail ourselves of the magnificent advances in medicine generally. Wearing masks has only recently become general, if indeed it is so; *x*-ray examination is still somewhat of a novelty; *x*-ray pelvimetry a rather exceptional event. And it would be an easy task to count the number of doctors who could lay their hands quickly on a supply of plasma and a giving-set when faced with a severe P.P.H. in the home. It is high time we asked ourselves, "Why this lag in just *one* branch of our art? We are accustomed to use all the new drugs and methods of investigation in other cases; why alone in midwifery is there this stasis?"

And why do the regulations of the Central Midwives Board refuse to allow a midwife to administer nitrous oxide and air unless she is accompanied by a trained assistant nurse? The Minnett is absolutely foolproof; it just can't give too much. Our midwives have the apparatus, have been trained, but because they just can't raise another midwife or nurse to take along to the case they must not use the machine. Surely this ruling is entirely out of date? Admitted, unless the patient can afford the services of an expert in anaesthesia for the entire duration of labour the ideal method is still to be found. But a simple technique and a safe one for the midwife would be pot. bromide and chloral at the beginning, repeated if necessary; gas-and-air when the patient begins to be uncomfortable, not when she is really up against it; and at this stage a hypodermic of pethidine 100 mg. In my own practice delivery of the head is usually done under light chloroform, and for any instrumental procedure in the home it is still the ideal drug.—I am, etc.,

Oakham. GORDON PURDY.

SIR,—May I protest strongly against the wholesale condemnation of the attitude of midwives in general towards women in labour as expressed recently in your columns. Some of your correspondents have had the most unfortunate contacts during their midwifery training, and one hopes that with more experience they will get a wider field of vision and not generalize from such short observation. One must realize that there are unpleasant and inefficient individuals in every profession, but that these are not representative of the whole. To counteract the impression left on some readers by the narration of your correspondents' sad experiences I feel bound to say that in the large Edinburgh maternity hospital where I trained such unkindnesses and inefficiencies as are instanced by them would not have been tolerated for one moment, nor have I since met the attitude they exemplify in my work in midwifery institutions. I have no reason to believe that the Edinburgh attitude of compassion and courtesy—taught alike to students, doctors, and nurses—and the unforgettable kindness shown to me by the complete staff in the English hospital where I myself had two babies, are unique.

The answer to Dr. Angela Hefferman's question (May 26, p. 748): "Why do all women of the higher income levels employ doctors rather than midwives for their confinements?" is, obviously, as she will in time discover, that almost all women of whatever income level employ a midwife in any case. They realize from acquaintances if it is to be their first confinement and from experience if other than the first, that when one is in labour one craves and appreciates tremendously the comfort and reassurance of a woman and an experienced midwife, although one may engage a doctor in case an emergency beyond the scope of a midwife should arise, as well as to ensure the "whiff of chloroform" at the end.

Would it appear malicious to add, in reply to the implication that the control of the Central Midwives Board is responsible for the continuance of the suffering of "the great majority of women," that if and when midwifery does come completely under the control of the medical profession women may still suffer during labour? And not, I hasten to add, through negligence on the part of the medical profession.

To conclude, it is to be hoped that your correspondents will soon meet with the usual type of midwife, the woman whose heart is in her work, her interest including the relief of her patient's pain whether due to actual physical causes or nervous tension, and whose sympathy, understanding, and skill enable the labourer to carry through with an otherwise unendurable task.—I am, etc.,

JANET LACK.

SIR,—I should like to reply to some of the statements made in recent issues of the *Journal* on women in labour. Such remarks as "the callous attitude of the midwives to women in labour"; "midwives are particularly unkind to the nervous patient with a rigid os"; and "during the London 'blitz' women who remained in town had to have their babies at home as the maternity wards were closed" surely were made by someone who knows little about midwifery and less about midwives.

During the London "blitz" I was night sister in charge of fifty maternity beds, which were usually full, at one of the largest London maternity hospitals. I speak as a midwife who has been practising a number of years, including the teaching of medical students. Sedatives and gas-and-air analgesia are given routinely to all patients as necessary in the wards I have known. It is due to old-fashioned ideas and medical prejudice that midwives are not allowed to give any drug stronger than pot. brom. and chloral, or an opium pill which contains 1/10 gr. morphine, without a doctor's written prescription. We know that women in labour have to suffer at times owing to shortage of staff; enough has been said of this in the medical and lay press.

Finally, even "women of higher income levels" are left in the care of midwives as neither the hundred-guineas obstetrician nor the general practitioner has the time to wait around until "the head is on the perineum." Your correspondent who cries out for the time when all women in labour will come under control of the medical profession will have to wait a long time when one considers that more than 76% of the births in this country are dealt with by midwives.—I am, etc.,

South London Hospital, S.W.4. NORA K. KELLY.

SIR,—My attention has been drawn to the correspondence in the *Journal* on the subject of women in labour. While I am in sympathy with those who deplore the neglect to maintain efficiently gas-and-air apparatus and the failure to train midwives adequately in its use, I feel that the essentials of the problem have been missed. I am convinced that a woman does not need an anaesthetic for a normal labour, but I know also how fear of the unknown can turn the uncomfortable sensations of labour into pain. Surely it is in the training of women for labour that the answer lies.

My first baby was born during the last fortnight. My labour lasted nineteen hours, and although I experienced discomfort particularly at the end of the first stage, I did not suffer anything I should describe as pain, and did not feel the need for an analgesic. The second stage I found hard work, but derived great satisfaction from being able to hasten my baby's arrival by my own efforts. My doctor advised me to use the gas-and-air apparatus for the delivery of the head to prevent my pushing too hard. I found this very helpful, not because I was experiencing pain but because by concentrating my attention on breathing deeply I was able to control the desire to push and thus avoided the alarming feeling of "splitting." I should have felt I had missed a great experience had I been unconscious when my baby arrived. I was thrilled to hold her in my arms when only half a minute old.

I am a qualified physiotherapist, and therefore had some advantage in realizing the importance of preparatory exercises, controlled breathing, and relaxation, but I have had no experience of midwifery, and consider that the most important factor in making my labour a thrilling and satisfying experience, instead of a painful operation, was my ante-natal education. This was not elaborate, and consisted of nothing more than making clear to me the processes of pregnancy and labour, and the part I would have to play in them. Any doubts and fears I had, born of my own ignorance and the harrowing tales of friends and relations, were allayed by frank answers to my questions. Doctors are, unwittingly perhaps, insulting the women they make the passive sufferers of a mystical ordeal of Nature. Give us, not the magic black-out from fear and torment, but the knowledge and the confidence to deal with them ourselves.—I am, etc.,

Southborough, Kent. JEAN SUTTON, C.S.P.

Obstetric "Specialism"

SIR,—In the Annual Report of Council, 1944–5 (*Supplement*, May 12, p. 82), it is stated that the Report on a National Maternity Service by the Royal College of Obstetricians and Gynaecologists "includes a proviso that the general practitioner who desires to undertake midwifery *must* have special experience." These self-appointed "Fellows" have an extraordinary opinion of themselves, but, their heads befogged in a cloud of self-adulation, they fail to realize that their "proviso" is a grave indictment upon their own capacity both as teachers of obstetrics and as practical obstetricians.

Carrying their advice into other spheres of medicine we should soon have our Royal Colleges of Surgeons advising that before a general practitioner would be allowed to diagnose the cause of a child's sore belly he must have special experience! Which is the more difficult, to carry out an ante-natal examination, a confinement, a post-natal examination, and decide when a case requires special hospital treatment, or to diagnose, in an infant, whether a sore belly is due to cystitis, obstruction, appendicitis, pneumonia, otitis media, or wrong feeding, and come to a decision rapidly enough to save a life?

In my opinion it would be a good thing if many of these "Fellows" spent two or three years under the supervision of a competent G.P. before being permitted to proceed to hospital for special experience and special training, and, further, a general practitioner should be a co-examiner at every obstetrical examination for ordinary degrees, higher qualifications, and under the Central Midwives Board. I wonder how many self-styled obstetric specialists know anything of normal labour. How many of them, since their student days, have watched a maternity case from beginning to end or seen hundreds of such cases as I and many of my colleagues have? We would have our women less fearful of labour than they are to-day, and less interference of labour carried on by the methods devised by God, if many of our obstetric specialists knew more about normal labour. Women of to-day would face labour as their mothers did, without fear, and full of joyful anticipation, and little, if any, post-natal suffering. What is this "special experience"? Possibly watching a variety of specialists carrying out a variety of episiotomies; possibly watching a variety of women in labour being subjected to a variety of anaesthetics—general, local, intravenous, and intrathecal—and a variety of stillborn infants make their appearance into the world; possibly viewing a variety of means of inducing premature labour with callous indifference for infant life, for conditions quite capable of being treated by simple common-sense medical means. One would, of course, view a variety of Caesarean sections, and picture on occasion the puzzled glow on the specialist's countenance as he wondered whether there was an ovarian cyst lurking in the background, the cold sweat pouring off his brow at the thought that he had removed the baby before the cyst.

Yes, there is a place for the obstetric specialist, a very vital place, though he makes just as many errors of diagnosis and judgment as the general practitioner, and he would be a fool if he did not; but there is no place for this driving women into ante-natal hysterics, irrational operative procedures, and breaking down the very foundations of home life by this constant specialist barking; this driving women to hospital, and a forgetting that midwifery, if it calls for our best judgment and common sense, is that department of medicine where diagnosis is easiest, and we can help our women in the vast majority of cases, by the simplest means in the world.—I am, etc.,

Tain. E. K. MACKENZIE.

Adrenalectomy in Paranoid Psychosis

SIR,—The further development of the case of psychosis treated by adrenalectomy, reported by Dr. Clifford Allen and Mr. L. R. Broster in the *Journal* of May 19 (p. 696), may be of interest.

The patient's physical condition has hardly been influenced by the operation. Though her voice has become higher her body up to the waist is still covered with thick and coarse hair, she has a vertical distribution of pubic hair, and has to shave her face frequently. During the first few months after adrenalectomy her thinking was retarded, she was easily tired, and complained of inability to concentrate and of lack of initiative. She was greatly distressed about this condition, and wondered whether she would ever get well. She found it difficult and embarrassing to meet people as she could not converse with them. She gained 7 lb. in weight. From the 4th to the 7th month after the operation she was given 2.5-5 mg. benzedrine and, for periods of 3 to 4 weeks, thyroid gr. 2 daily. Gradually she lost her excessive weight, became more self-confident and sociable, and was able to resume normal household and social activities. Eventually she took up regular duties at a Forces' canteen.

With regard to her mental state the operation has proved a complete success so far. She has lost all psychotic symptoms and homosexual leanings, her habits have become feminine again, and she dresses with care and smokes little. In addition, the claustrophobia, the facial tic, and the occasional stammering which preceded the psychosis for at least seven years have disappeared. She is now three months pregnant and looks forward to having a child.—I am, etc.,

Manchester. LEO WISLICKI.

Tuberculosis of the Lower Lobe

SIR,—I am grateful to Dr. George Luntz for calling attention in his letter (May 26, p. 747) to a passage in my article on the above subject in which I referred to the use of pneumoperitoneum. I agree with Dr. Luntz and the authors he quotes that diaphragmatic paralysis is generally more efficient with lesions of the lower and upper lobe than in the middle lobe, and I regret that the disputed passage gave the impression, which I did not mean to convey, that phrenic paralysis followed by pneumoperitoneum was *particularly* valuable in mid- and lower-lobe lesions.

At the same time I would like to point out that my article was dealing with the lower lobe, and the passing reference to middle-lobe cavities was not intended to be taken as a definitive conclusion. I can only say that though the number of

middle-lobe cavities I have so far treated by phrenic paralysis and pneumoperitoneum is comparatively few, this treatment has been successful in a sufficient number of cases to warrant its trial when artificial pneumothorax fails.—I am, etc.,

Essex County Hospital, Braintree. R. C. COHEN, M.D.

Shall We Nationalize Medicine?

SIR,—The letter from Dr. Dakin (May 19, p. 715) is, in my opinion, one of the most sensible of the numerous letters written on the subject of a national medical service. Dr. Dakin rightly stresses the importance of conducting professional work away from the home. The difficulty of obtaining adequate domestic help before the war was acute and may even be more so after the war. The shortage of domestic workers may render practice from health centres almost essential if doctors and their wives, especially the latter, are to lead lives of reasonable comfort free from intolerable drudgery.

Whereas it would be undesirable to curb a doctor's potentialities by unduly restricting the size of his practice, there is obviously a limit to the number of patients to whom he can give adequate attention, this number depending on the type of practice, urban or rural. Further, if the whole population is to be insured the option suggested of permitting patients to make their own private arrangements for medical treatment matters little to the doctor. What certainly does matter is the capitation fee, for if this is adequate it may well be that in the average practice the practitioner may prefer all his patients on his insured list. With a basic capitation fee of, say, £1 a practitioner would probably obtain a greater net income than from a practice composed partly of private patients with expenses in connexion with drugs, dispensing, etc.

I agree with Dr. Dakin that it is lamentable that conditions in practice nowadays are such that many doctors, especially the single-handed ones, have to work unreasonable hours making undue demands on their physical and mental powers. This pernicious state of affairs could be rectified by practice from health centres, in which more or less regular hours of work could be arranged, with rotas for night work and holidays for all. Those doctors referred to by Dr. Dakin who feel they are not true to their calling unless always on duty could gratify their desires to the full, for in each centre there would be a fair proportion of doctors who like, and feel entitled to, recreation at the end of an exacting working day. Under a national medical service with practice divested of much of its competitive character, it would be interesting to observe whether the zest for work and day and night devotion to duty of some doctors would continue unabated, or would decline with the curtailment of income which would occur in some instances.—I am, etc.,

Hornsea. L. FRENCH.

Flour in the Loaf

SIR,—Sir Ernest Graham-Little, having been shown to be completely wrong in his statement that the germ of imported wheat is removed in the country of origin before importation to this country, now brings forward another suggestion in his letter (May 26, p. 750). This suggestion is that the majority of the cereals imported is in the form of white flour (germ removed), so that the amount of germ imported via wheat is small. Again, Sir Ernest Graham-Little is, as is so often the case, entirely wrong as to his facts. The majority of imported cereals is in the form of wheat, from which, as he now knows, the germ has not been removed. This is clearly seen from the fact that the present miller's grist in this country for the manufacture of flour for bread-making is approximately 40% English wheat and 60% imported wheat (mainly Manitoba). The imported flour (germ removed) added is less than 20%, so that, contrary to what Sir Ernest Graham-Little states, there is about three times as much wheat imported as flour. The correctness of these statements can be easily confirmed by inquiry at the Ministry of Food. It is unfortunate that Sir Ernest Graham-Little does not trouble to get his facts correct and gives publicity to statements which are incorrect and hence misleading.

I purposely refrained from entering into controversial matters and have merely restricted myself to showing that statements, on which certain arguments are based, are incorrect in fact. Hence I do not propose to carry on this correspondence. However, perhaps I might be permitted to make the following observations.

Sir Ernest Graham-Little says (May 26, p. 750): "I think Dr. Kent-Jones is likely to hear from the makers of biscuits whose product is thus revealed as consisting, like the pre-war bread, almost entirely of starch!" My experience of biscuit manufacturers is that the majority of them are not likely to be at all perturbed by my statement of fact concerning the destruction of B_1 in biscuits, but they will know that the claim that biscuits merely contain starch is another example of Sir Ernest Graham-Little's misstatements. Biscuits contain, besides starch, protein and fats and other nutrients.

Sir Ernest Graham-Little further states: "It may profitably be noted that Russian soldiers have won their resounding victories on a diet mainly composed of whole-grain bread." This interesting observation can scarcely be considered as a serious argument. If it is, then one must also remember the great victories gained by the American soldiers who received enriched white bread. Also, readers may like to remember that the youth of Great Britain, bred on white bread, whatever its defects, fought and won two major wars in the last twenty-five years.—I am, etc.,

Ealing, W.5. D. W. KENT-JONES.

SIR,—Sir Ernest Graham-Little, having been shown to be factually inaccurate on every major point he attempted to make, now retires behind a smokescreen (May 26, p. 750). His argument now is "that it is against the interests of the public . . . to divert one penny-weight [of wheat germ] to any purpose other than the provision of the most nutritive national loaf that science can devise." The only purpose for which germ (in the form of milling offals) can be diverted from the national loaf is for stock feeding purposes, a fact of which Sir Ernest Graham-Little is well aware. The rest of his letter is therefore irrelevant to the point under discussion. Careful scrutiny reveals, indeed, that he does not—because he cannot—contradict my statement (supported as it is by numerous Hansard references) that "not one flake or particle of Bemax is derived from flour either intended to be or actually used for bread-making." This is my point and on that I rest.—I am, etc.,

H. C. H. GRAVES,
Chairman and Managing Director,
Vitamins, Limited.

London, W.6.

*** This correspondence is now closed.—Ed., *B.M.J.*

Civilian Jobs for Medical "Other Ranks"

SIR,—Many medical practitioners must have had the experience during these war years of working with Regimental and Medical Corps N.C.O.s and orderlies, and found them, if "unskilled," most efficient. Are these men now to be returned to their forges, shops, and ploughs, and so lose the training they have acquired and also be a complete loss to our profession, or can we offer them reasonable employment at reasonable wages? Could some of them not administer our smaller hospitals, or if "rehabilitation" is to increase vastly is this not the man-power—and many being ex-bandsmen have an additional musical knowledge—which we must seize? If any organization exists for the absorption of these people can it not be given wider publicity so that those of us still in a position to direct may be able to give the correct directions?—I am, etc.,

Helensburg, Dumbartonshire. JOHN MCD. GLENNIE, M.B.

The Services

The following appointments and award have been made in recognition of gallant and distinguished services in Italy:

O.B.E. (Military Division).—Cols. K. A. Hunter, G. A. Sinclair, and H. G. Young, D.S.O., M.C.; Lieut.-Col. W. L. Coke; and Major D. A. Young, R.C.A.M.C.

M.C.—Major (Acting) D. W. McCullough, R.C.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES

Missing, presumed killed.—Surg. Lieut.-Cmdr. Ronald Grant Dingwall, O.B.E., R.N.

Obituary

CARLTON OLDFIELD, M.D., F.R.C.P., F.R.C.S.

We regret to announce that Mr. Carlton Oldfield, the well-known Leeds consultant and former professor of obstetrics and gynaecology in the University of Leeds, died on May 27 at his home, Moor House, Harewood, aged 74. Almost the whole of his professional life was spent in the Leeds district, with which his family has had a long association.

A student of the Leeds School of Medicine, Carlton Oldfield came to London to take the English Conjoint Diplomas in 1893, graduated M.B., B.S.Lond. two years later, and proceeded M.D. in 1905 after holding a succession of junior posts. He became a Fellow of the Royal College of Surgeons of England in 1909 and was elected a Fellow of the Royal College of Physicians of London in 1928. Before his appointment to the staff of the General Infirmary at Leeds as honorary gynaecological surgeon he had been surgeon to the Leeds Maternity Hospital and to the Leeds Hospital for Women, and he was also visiting gynaecologist to the Batley and District Hospital, the Dewsbury General Infirmary, the Wakefield Clayton Hospital, the Skipton and District Hospital, and the Coronation Cottage Hospital at Ilkley. In 1919 he succeeded the late Prof. J. B. Hellier in the chair of obstetrics and gynaecology at Leeds University and held the professorship until 1932. He retired from active practice in 1939. He had examined for some years in his subject at the University of Oxford, and was a past president of the North of England Obstetrical and Gynaecological Society. In 1929 he revised Herman's standard work *Difficult Labour* for its seventh edition; he wrote the article on septic infections for Eden and Lockyer's *New System of Gynaecology*, and contributed papers to this and other journals.

Mr. Oldfield joined the British Medical Association in 1897 and was honorary secretary of the Section of Gynaecology and Obstetrics at the Annual Meeting held in London in 1910; he was also for many years a member of the Leeds and West Riding Medico-Chirurgical Society and a Fellow of the Royal Society of Medicine. Throughout his career as teacher and consultant he took a warm interest in the advancement of younger members of the hospital staff and in the promotion of better welfare and working conditions for the nurses. He leaves a widow, two sons, and two daughters; one son is Major Michael Oldfield, F.R.C.S., now serving abroad with the R.A.M.C., who in civilian life is assistant surgeon to the General Infirmary at Leeds.

JOHN DICK, M.B., D.P.H.

J. J. J. sends the following appreciation of the life and work of Dr. John Dick, medical superintendent of St. James's Hospital, Leeds, from 1926 to 1945.

He joined the staff of Firvale—now the City General Hospital—in Sheffield where, under the efficient tutelage of Dr. James Clark, its distinguished medical superintendent, also a Scot, he learned not only how to apply the knowledge he had acquired in Edinburgh but also how to administer a large hospital, and in a comparatively short time he was promoted to the post of deputy medical superintendent. In 1926 Dr. James Allan, the venerable and well-loved medical superintendent of St. James's Hospital in Leeds, retired, and out of a large number of applicants Dr. Dick was chosen to fill the vacancy. He was then only 32 years of age, which was considered young for the holder of such an onerous post. For the first eight years of his service in Leeds he was an officer of the Public Assistance Committee, and it was not until 1934, when the three hospitals under the control of that committee—St. James's, St. Mary's, and St. George's—under powers conferred by the Local Government Act of 1929, were appropriated as part of the general hospital service of the city, that he was transferred and became a member of the staff of the Public Health Department.

From the outset of his public life his desire was to see St. James's Hospital in the first rank not alone of municipal general hospitals but of all, including the most up-to-date voluntary hospitals, and towards this goal he strove with might and main. At the time of his death the goal was in sight, and he had the satisfaction of seeing the first-fruits of his labours beginning to appear. He reorganized the medical and nursing staffs, modernized and re-equipped the wards, built new operating theatres, pathological, radiological, and physiotherapy blocks, and installed new *x*-ray and electrical apparatus. For the nurses, whose comfort and welfare lay very close to his heart, he provided extended and improved accommodation for living, dining, and recreation, and to assist them in their studies and preparation for their examinations a complete and up-to-date school of instruction. What he did for St. James's he did in a minor degree for the other hospitals under his care. At St. Mary's Infirmary in particular out of a block that had become obsolete he fashioned and equipped on modern lines a maternity unit. Acutely alive to the social implications of disease, he was instrumental in establishing an almoner's department with a staff of trained and qualified almoners to serve all the hospitals in the group.

Perhaps his greatest work, however, lay in his linking up of St. James's Hospital with the General Infirmary at Leeds and the other voluntary hospitals in the city. With skill and tact—for at the inception of the idea there was suspicion on both sides—he overcame opposition and succeeded in bringing the two systems together and interweaving them in such a way as to form a useful and valuable combination. In furtherance of this policy of friendly co-operation he built up a staff of visiting specialists who, in the main, were the same as those attached to the General Infirmary at Leeds and teaching school, thus taking the first step towards the identification of St. James's Hospital with the Leeds School of Medicine in the teaching of undergraduates. That St. James's Hospital should one day become a teaching hospital and enter the ambit of the Leeds University was one of his dreams which may be nearer fulfilment than even he at the time of his death realized. The formation of a Joint Hospitals Advisory Committee, with which he was intimately associated, was another step in the same direction.

The last, and not the least important, of his achievements was the taking over from the Public Assistance Committee in April, 1944, of the buildings known as North Lodge, which adjoin St. James's Hospital, and their appropriation for hospital purposes, thus raising the number of beds in the combined hospitals (North to South) to 1,800, which makes it the largest general hospital in England. Plans for adaptation of the newly acquired buildings have been approved and part of the work has been carried out, but the completion of the scheme will occupy many months. Though the author of these plans and proposals will not see them come to fruition, the hospital when complete will be another monument to his foresight and enterprise. This addition to the territory under his control made it necessary to share the responsibility for the management of the hospitals with another medical superintendent. The hospitals were split into two groups—an inner, consisting of St. James's Hospital (North and South), and an outer, of the other hospitals, now increased to three. While retaining the medical superintendency of the inner group he continued to exercise a general supervision over the whole, under the title of Medical Director of General Municipal Hospitals. The burden resting upon his shoulders, at no time light, was greatly enhanced by the war. He was called upon not only to arrange for the protection of the hospitals from air attack but also to ensure their proper staffing and maintenance under the most trying conditions. St. James's became an E.M.S. Hospital and was adapted to deal with civilian as well as military casualties, while within it there was incorporated a special unit for injuries of the face and jaw, the only one of its kind in the region. For a short period at the beginning of the war he was lent to the Ministry of Health to help in the planning and development of a hospital system for the North-East region.

Nineteen years in the normal span of human life and experience is not a long time, but when those years are packed with high endeavour and great achievement they make history. What Dr. Dick wrought for the advancement of medical science during the nineteen years of his superintendency will form an outstanding chapter in the history of the hospital service of Leeds. In his home life he was fortunate too. If he had given much to St. James's Hospital it did not deal niggardly with him, for it gave him a wife. In Mrs. Dick he had one who not only loved and sympathized but who knew and understood the weight of responsibility he had to carry, and was therefore able to render the help he so much needed, especially during the anxious days of the early part of the war. In the turmoil of life his home was an oasis where he found refreshment, encouragement, and hope. When death came it found him as he would have wished it to find him, at his post surrounded by familiar scenes and sounds and faces in the midst of the institution he knew and loved so well and for which he had laboured so assiduously, so faithfully, and so long.

Dr. THOMAS DIXON TODD died at Wath-on-Dearne on May 23. Before studying medicine he had been a schoolmaster, and for eleven years was senior languages master at Mansfield Grammar School. He qualified M.B., B.S.Durham in 1939, and after a period at Darlington and Ollerton settled in practice at Wath-on-Dearne four years ago. While of a retiring disposition, those who were privileged with his confidence and friendship realized his innate courage clothed with gentleness, his inherent steadfastness concealed under a never-failing courtesy and regard for others. He was held in high esteem by his colleagues and patients, and his untimely death is a grievous loss to the district. Deep sympathy is extended to his nearest and dearest.—I. C.

Universities and Colleges

UNIVERSITY OF OXFORD

In Convocation on May 29 it was resolved to confer the honorary degree of D.Sc. on Hubert Maitland Turnbull, M.D., F.R.S., F.R.C.P., Professor of Morbid Anatomy in the University of London.

Charles Garrett Phillips, B.M., B.Ch., has been elected to an official Fellowship as Lecturer in Physiology at Trinity College. Miss Celia K. Westropp, D.M., has been appointed to a Tutorship in Natural Science at Lady Margaret Hall.

UNIVERSITY OF LONDON

London School of Hygiene and Tropical Medicine

At the end of the present session Prof. Major Greenwood, F.R.S., retires from the Chair of Epidemiology and Vital Statistics at the London School of Hygiene and Tropical Medicine under the age limit. Owing to a change in the distribution of teaching and steady increase in the volume of research work and teaching within the field of medical statistics, the title of the chair has been changed to that of Medical Statistics. Mr A. Bradford Hill, D.Sc., Ph.D., Reader in Medical Statistics in the University since 1933, has been appointed to fill the vacancy. The Senate has conferred upon the retiring professor the title of Professor Emeritus in Epidemiology and Vital Statistics in the University of London.

UNIVERSITY OF MANCHESTER

At the meeting of the University Court on May 30 Sir John Stopford, the Vice-Chancellor, gave a general survey, in which he said that by December the University would be virtually "unwound" except for certain controls with regard to the admission of students and the completed return of the teaching staff. One of the major problems for a long time ahead would be the finding of new members of staff. Limited accommodation was a secondary difficulty; they were faced by a considerable increase of students to meet the urgent national demand for teachers, doctors, and dentists. Three new chairs had been established, including one in medicine and one in industrial health; the former would be whole-time, as had been contemplated before the war; and the latter was, under Dr. R. E. Lane, the first full professorial department in the subject in Great Britain. The Vice-Chancellor was hopeful that by next September the University would have the financial support needed to start a full professorial department of child health.

UNIVERSITY OF EDINBURGH

Charles Cameron, M.D.Glas., F.R.F.P.S., has been appointed to the Chair of Tuberculosis in the University in succession to the late Sir Robert Philip. Dr. Cameron has been medical superintendent of the South-East Counties of Scotland Sanatorium, East Fortune, for the past 22 years, and took charge of the tuberculosis department at Bangour Hospital under the Emergency Medical Service. He is a past president of the Tuberculosis Society of Scotland.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The Croonian Lectures, which were unavoidably postponed, will now be given at the College by Surg. Capt. Macdonald Critchley on Tuesday and Thursday, July 10 and 12, at 4.30 p.m. His subject is "Problems of Naval Warfare under Climatic Extremes."

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Sir Hugh Devine's Honorary Fellowship

The President, Sir Alfred Webb-Johnson, Bt., has received from Sir Alan Newton, President of the Royal Australasian College of Surgeons, a letter dated March 19, 1945, in confirmation of a personal message by air mail, recording that H.R.H. the Duke of Gloucester had admitted Sir Hugh Devine as an Honorary Fellow of the Royal College of Surgeons of England at Government House, Melbourne, on Feb. 23. Sir Alan Newton enclosed a copy of his address to the Governor-General of Australia and also of His Royal Highness's reply, part of which was spoken directly to Sir Hugh Devine, a founder and Past-President of the Royal Australasian College of Surgeons, as follows: "The value of your work in the advancement of surgery has been most deeply appreciated and your wise and cautious guidance has been the means of saving many lives during the war—so much so that your counsels have come to be spoken of as the 'Devine Precepts.' Australian surgeons have made most remarkable and stimulating contributions to the science and art of surgery, and none have been more fruitful than your own. It is therefore a special pleasure to me to bring you greetings from your colleagues of the Royal College of Surgeons of England, of which I am myself an Honorary Fellow, and to present you with your Diploma. In the name of the College and by the authority of the President and Council I admit you as a Fellow of the Royal College of Surgeons of England—*Honoris Causa*." The following is a quotation from Sir Alan Newton's letter to Sir Alfred Webb-Johnson: "May I take this opportunity of emphasizing the f that my reference to our debt to the Royal College of Surgeons England expressed the feelings of all the Fellows of the Ro Australasian College of Surgeons. It is our intention to send a gift of money to help you to repair the damage to the Col in Lincoln's Inn Fields and we intend to obtain for you anatomical and pathological specimens as may be of value to y Either I or my successor who will be appointed in May of year will write to you further about these intentions. It wa very great pleasure to us that Surg. Capt. Lambert Rogers was a to be present on this occasion and we look forward to see him again at a College meeting to be held in Melbourne in M There will be a public meeting in the Wilson Hall, where you remember giving your Syme Oration with such success, and I h arranged for Lambert Rogers to speak at this meeting as a mem of your Council. I know that he will make a public reference the close association between the two Colleges. I trust that you your Council will approve of the way in which the ceremony carried out in Australia, and assure you that Devine, and all of who are his colleagues, are deeply appreciative of the great hono you have done to Australasian Surgery in conferring an Honor Fellowship upon him."

Medical Notes in Parliament

Artificial Insemination in Animals

Mr. TOM WILLIAMS moved on May 17 the second reading the Agriculture (Artificial Insemination) Bill. He reminded House that Section 17 of the Agriculture (Miscellaneous P visions) Act, 1943, had endorsed the principle of control development of artificial insemination. Problems still requir investigation, such as the keeping quality of semen, insemi tion methods, and technique, which were unsuitable for vestigation at a commercial centre. In Clause 1 of the n Bill the Minister of Agriculture and the Secretary for Scotla sought power to set up artificial insemination centres wh research and experiments could be carried on. These cent would also provide a limited service to farmers in the nei bourhood. The clause would also allow financial assista to be given to organizations or persons undertaking appro investigations. The clause would enable the Ministry to ca out investigations in the case of all animals, including poul but not human beings. In England and Wales the M Marketing Board were leading in the establishment of artifi insemination centres. The method was going to be of m use for dairy herds than for beef herds.

Mr. WOOTTON-DAVIES said the process had been of m use for horses than for cattle. He himself sent to Sc America semen from his rams. But the House should approve this method without consideration. The mating animals was not just like mixing an acid with an alkali. PRICE doubted whether the country had stock which could used with certainty for improving the quality of dairy ca Mr. CHAPMAN, replying for the Government, said the Ministries concerned had arranged, in printed regulations thorough control of the practice of artificial insemination

The Bill was read a second time.

Pneumoconiosis and the Mines Inspectorate

Moving on May 29 a motion to approve the Coal Cha (Amendment) Order, Major LLOYD GEORGE said he had m complaints of the food for miners. It was disappointing find so small a percentage of the mineworkers taking advantage of the extension of canteen facilities. He wished say a word about health services. Rehabilitation centres been greatly increased during the last four years with the of the Welfare Commission. With regard to pneumoconio which affected miners most in West Wales and South Wa the Ministry of Fuel and Power had been able to increase staff of doctors, with great difficulty, to reduce the waiting It was to have a research centre. There, he hoped, a c would be found for this disease about which little was kn at present. The waiting-list was at one time 3,000. There been some change since increased medical staff were obtain He hoped to get rid of the arrears in nine to twelve mon

Dr. SUMMERSKILL asked how many specialists there were pneumoconiosis. Major LLOYD GEORGE said there were f panels. His recollection was that a doctor who was a specia in the disease was at the head of each. It was difficult to the right men. He was told that one could not regard ordinary tuberculosis specialist as having any real knowle of this extraordinary disease. He hoped after the Japa war to have the services of many more who had experie of the disease, and also that as a result of putting up a rese

entre to have a proper clinic and contacts with other countries where the same thing was found in different forms.

Dr. MORGAN asked what steps were being taken to train either young medical men or older men who were experts in respiratory diseases to enable them to get the requisite knowledge of the disease. Major LLOYD GEORGE said there was a great shortage of medical men of all categories. The Ministry had increased the number of panels available. He was anxious to clear off the waiting-list. Dr. MORGAN said that when the Ministry was formed there were about nine medical inspectors for the different mining districts. He did not know the present number. Did their work deal purely with safety arrangements? Had it anything to do with ventilation or humidity? Could the House get any detailed health statistics for the industry as a whole? There were now three teaching schools with professorships of industrial medicine, but no lectureships in London connected with it. Had the Minister a Medical Appointments Board? How did he recruit and train these inspectors? Medical men did not know. What arrangements were being made for the appointment of a Silicosis Board? There should be intensive training, because the more machinery put into the mines the more dust and cases of disease there would be. The Minister's medical inspectors should ensure that when accidents happened the roads were cleared so that the badly injured workman could be got out of the mine easily.

The "Minister of Health"

Mr. CHURCHILL remarked on May 30 that he never liked the change from "President of the Local Government Board" to "Minister of Health," but thought it would be a great mistake to make another change now.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* large increases were reported in the incidence of measles, whooping-cough, acute pneumonia, dysentery, and diphtheria, which rose by 1,714, 269, 101, 91, and 85 cases respectively. Seven cases of typhus fever were notified.

Whooping-cough increased in most areas of the country, the largest rises over last week's totals being Yorks West Riding 37, Lancashire 41, London 29. Diphtheria was most prevalent in the North; the chief local rises over last week's totals were: Northumberland 16, Staffordshire 13, Durham 12, Derbyshire 12, Worcestershire 11. There was a general rise in measles, except in the north. The largest increases were in the counties surrounding London, the increases over last week being as follows: Surrey 233, Kent 163, Buckinghamshire 106, Bedfordshire 102, Berkshire 102, Hertfordshire 99. Yorks West Riding reported a fall of 107 in incidence.

The rise in dysentery was due mainly to increases in existing outbreaks. The largest returns were Lancashire 56, Yorks West Riding 50, Staffordshire 46, London 31, Gloucestershire 24, Middlesex 22, Warwickshire 22, Essex 14, Pembrokeshire 14, Hertfordshire 12, Glamorganshire 11, Kent 10, Southampton 10, Lincolnshire 10.

In *Scotland* notifications exceeded last week's totals as follows: measles 248, whooping-cough 56, scarlet fever 16, diphtheria 9. The increase in measles and whooping-cough was mainly in Glasgow. There was one case of typhus fever.

In *Eire* the notifications of whooping-cough increased by 42, and of measles by 10, but there were 10 fewer cases of diphtheria. The rise in diarrhoea and enteritis—26—was due to an outbreak in Dublin C.B., where 25 of the 36 cases were reported.

In *Northern Ireland* there were 16 more cases of whooping-cough than last week.

Typhus in Paris

Sixty-six cases of typhus have been reported in Paris, 64 of the patients being former prisoners or deportees. In anticipation of returning prisoners spreading infection Shaef ordered all men in rear areas to be inoculated or reinoculated against typhus some weeks ago.

Week Ending May 26

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,295, whooping-cough 655, diphtheria 396, measles 11,408, acute pneumonia 487, cerebrospinal fever 50, dysentery 374, paratyphoid 3, typhoid 8. The cases of typhus during the past weeks have occurred among returning prisoners of war. Anyone entering Britain from the Continent has to undergo a rigorous test for typhus, and special precautions have been taken in case of an outbreak.

No. 20

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 19.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945					1944 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	64	2	24	3	—	62	6	20	4	3
Deaths		—	1				1	2		
Diphtheria	498	27	127	59	14	598	23	138	75	55
Deaths	4	—	1	1	1	3	1	2	1	—
Dysentery	434	31	106	12	—	276	18	81	—	—
Deaths				1	—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	—	—	—	—	—
Deaths		—					—			
Erysipelas			40	13	1			44	8	3
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				36					17	
Deaths	51	9	8	9	3	45	9	14	8	4
Measles*	14,126	819	451	63	12	2,255	213	479	211	25
Deaths	3	—	—	—	1	1	—	—	2	—
Ophthalmia neonatorum	78	4	11	—	—	98	6	35	—	—
Deaths										
Paratyphoid fever	2	—	1 (B)	—	1 (B)	3	—	9 (B)	16 (B)	—
Deaths	—	—	—	—	—	—	—	—	1 (B)	—
Pneumonia, influenzal†	612	23	7	12	4	806	63	22	8	8
Deaths (from influenza)	13	—	2	—	—	17	2	2	1	—
Pneumonia, primary			202	44				205	35	
Deaths		19		11	9		30		9	6
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	3	—	1	—	—	5	1	2	—	—
Deaths		—					—			
Puerperal fever		6	7		—		1	12		
Deaths										
Puerperal pyrexia‡	132	11	11	1	—	142	4	16	1	1
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,340	62	230	12	34	1,733	121	172	20	56
Deaths	—	—	—	—	—	2	1	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	2	—	—	4	2	5	—	2	3	1
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	7	—	1	—	—	—	—	—	1	—
Deaths				—	—				—	—
Whooping-cough*	1,068	60	131	77	29	2,619	239	182	38	25
Deaths	7	1	3	—	—	11	4	1	—	1
Deaths (0–1 year)	327	42	63	37	25	324	46	79	29	18
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,314	589	634	231	142	4,077	634	584	222	136
Annual death rate (per 1,000 persons living)			14·4	14·9	§			13·4	14·4	§
Live births	7,729	816	965	394	280	7,339	882	1030	593	350
Annual rate per 1,000 persons living			19·3	25·4	§			20·9	—	§
Stillbirths	203	21	38			222	25	30		
Rate per 1,000 total births (including stillborn)			38					28		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Medical News

H.R.H. the Princess Elizabeth will present prizes and certificates to students of the London (Royal Free Hospital) School of Medicine for Women on Thursday, June 21, at 3 p.m. in the Great Hall, British Medical Association House, Tavistock Square.

The forty-sixth annual meeting of the Association of Port Health Authorities of the British Isles is to be held in the City Hall, Cardiff, on June 14 and 15. There will be a tour of the docks and visits to the Royal Hamadryad Seamen's Hospital and the Llandough (Cardiff Municipal General) Hospital. Mr. D. G. Hoppins will read a paper on "The Port of Cardiff in Wartime," Mr. J. W. Wellwood on "The State and the Welfare of Merchant Seamen in Ports," and Col. P. G. Stock on "The International Sanitary Convention of 1944."

On Friday, June 15, at 4.30 p.m., a coloured film showing movements of the brain in concussion, etc., will be demonstrated by Lieut. Robert Pudenz, U.S.M.C., at the Royal Society of Medicine. By means of high-speed cinema-photography a monkey's brain has been investigated through a plastic calvarium. Lieut.-Gen. Sir Alexander Hood will preside.

The Queen's Institute of District Nursing Secretaries Association has arranged a National Conference of District Nursing at 10.45 a.m. on Saturday, June 16, in Crane Theatre, Hanover Street, Liverpool. The speakers include Sir Weldon Dalrymple-Champneys, D.M., Miss J. M. Calder, Miss E. J. Merry, and Dr. O. R. Belcher.

The East India Association (3, Victoria Street, S.W.1) announces that on Tuesday, June 19, at 2.30 p.m., at the Rooms of the Royal Society, Burlington House, Piccadilly, brief addresses on "Indian Health Problems: Some Recent Voluntary Efforts" will be given by Lieut.-Col. I. M. Orr, M.D., R.A.M.C.(ret.), Mr. Howard Somervell, F.R.C.S., and the Rev. J. C. McGilvray, bursar of Vellore Christian Medical College.

Lord Moran, P.R.C.P., will deliver the Cavendish Lecture before the West London Medico-Chirurgical Society at Kensington Town Hall on Tuesday, June 19, at 8.30 p.m. His subject is "The Art of Command."

The annual meeting of the Members of the Royal Medical Benevolent Fund will be held at 3.30 p.m. on Wednesday, June 20, at the Medical Society of London, 11, Chandos Street, W.1, when the financial statement for 1944 will be presented and the officers, committee, and honorary auditors elected for the current year.

A clinical meeting of the Middlesex County Medical Society will be held at Harefield County Hospital on Wednesday, June 20, at 3 p.m. Clinical demonstrations will be followed by a short paper by Drs. E. Nassau and P. F. Kennish entitled "An Analysis of Cases Admitted for Treatment from the Mass Radiographic Unit."

A special meeting of Fellows of the Royal Society of Medicine was held on May 24, at which eight elections were made to the Honorary Fellowship of the Society, the highest honour which the Society can bestow. The British recipients were Surgeon Vice-Admiral Sir Sheldon Dudley, Lieut.-General Sir Alexander Hood, Air Marshal Sir Harold Whittingham, and Sir Francis Fraser, respectively Directors-General of the Medical Services of the Royal Navy, the Army, and the Royal Air Force, and the Emergency Medical Service. The four foreign recipients were Colonel V. L. Gallemaerts, Colonel-General Smirnov, Dr. Karl Evang, and Colonel Frantisek Langer, representatives respectively of the medical services of Belgium, Russia, Norway, and Czechoslovakia. At the same meeting it was announced that the 1944–5 award of the Gold Medal of the Society had been made to Brigadier Sir Lionel Whitby. To the presidency of the Society Surgeon Rear-Admiral G. Gordon-Taylor was re-elected for a further term.

Princess Arthur of Connaught was the chief guest at a luncheon party on May 30 at the Mansion House in support of an appeal for funds to rebuild and equip the Marie Curie Hospital for cancer and allied diseases. Another guest was Lieut. Eve Curie, daughter of Mme Curie. The Lord Mayor presided. The main building of the hospital in Fitzjohn's Avenue, N.W., was totally destroyed by enemy action, and the *x*-ray wing was seriously damaged.

The difficulty of ridding clothing, etc., of lice and their eggs by baking the articles at a temperature of 212° F. for twenty minutes is that clothes—woollen articles particularly—are good insulators. The Industrial Gas Centres of the Gas, Light and Coke Company and the South Metropolitan Gas Company have provided a means of heating a disinfestation oven—a brick chamber open at each end, through which a conveyor carrying frames for the clothing and blankets is passed. Information on the method of heating, safety devices, and the tests of efficiency of the oven in killing lice and their eggs carried out by Dr. Busvine are contained in a memorandum received from Gas Industry House, London, S.W.1.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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ANY QUESTIONS?

Disappearance of Psoriasis in Pregnancy

Q.—*A woman aged 22 had psoriasis in head, neck, elbows, and knees. Various treatments improved the condition, but it always returned. She got married and became pregnant; the rash disappeared at once, but reappeared soon after the baby was born. She has now had three confinements, and the same disappearance and return of the rash has happened each time. Would treatment with the male hormone be of any use? Possibly someone has already had similar cases, and treated them with a hormone.*

A.—Disappearance of the rash of psoriasis during pregnancy is met with occasionally. As it is not a constant phenomenon and as the reverse may occur, the interpretation in the light of present knowledge is difficult or impossible, and affords no precise indication for hormonal treatment.

Humidity of Temperature of Inspired Air

Q.—*In the B.M.J. of March 10, in reply to a question on asthma conditions and chronic bronchitis, it is said that the bronchial mucous membrane is atrophic and therefore unable to deal satisfactorily with changes of humidity and temperature. Is it ever the function of the bronchial mucous membrane, even when healthy, to affect the humidity and temperature of inspired air? Is this not the function of the mucous membrane of the nose, where the turbinate bones, acting like baffles, enforce a more prolonged contact of the incoming air with warm and moist mucous membrane? In my experience chronic bronchitics are unconscious and unwitting mouth-breathers in that automatically, before each act of coughing, air is inspired through the mouth, although the nose itself is free and unblocked. Automatically the nose, the natural air-conditioning plant of the body, is by-passed. Chronic bronchitics should, therefore, be taught to close the mouth at the end of each act of coughing and inhale slowly through the nose.*

A.—Normally, with quiet breathing, the nasal mucosa serves to warm and moisten the inspired air; but when the ventilation volume is increased, as during exercise, air is taken in also through the mouth and it is likely that part of the moistening and warming occurs in the lower respiratory passages. Even the atrophic mucosa must be warm and moist and able to exert some effect on the inspired air. But in doing so the mucosa loses water and heat and it is unlikely that the atrophic mucosa can replace them as rapidly as the normal mucosa can. During coughing, as your correspondent says, air is likely to be inspired through the mouth. It is the drying of the atrophic mucosa and consequent irritation which should be avoided. Nose breathing should help to prevent this, but whether slow inhalation through the nose is always possible when coughing is reflexly induced is open to question. However, there seems to be no harm in trying.

Giant Urticaria

Q.—*A young farmer suffers from chronic urticaria; his eyelids, lips, and tongue swell, and wheals have appeared over his body, the largest being the size of a dinner-plate. Attacks occur most often in the evening. During the day he is usually free. No treatment of any avail. What should be done?*

A.—Chronic urticaria, with or without "giant" lesions, may be related to many factors, among which focal infection, food allergy or a psychological disorder may be the determining causes. It is remarkable how the removal of an infected tooth or the elimination of some unsuspected article of food may sometimes produce complete relief. As all physical measures of treatment have failed, psychotherapy should be considered. The possibility of oedema of the glottis should be kept in mind: severe attacks can be often reduced by 5 minims of adrenaline injected hypodermically and repeated every 15 minutes up to a reasonable limit.

Chronic Sinusitis and Swimming

Q.—Is it safe to permit swimming in the case of a sufferer from chronic maxillary sinusitis? (I take it diving is absolutely contra-indicated.)

A.—It should be safe to permit side and breast stroke; but such facing strokes as trudgeon crawl would be as risky as diving. In small bath there would be some risk to other bathers, however.

Professional Secrecy and the Law

Q.—As an M.O. at a mental hospital, am I legally entitled to tell the wife of a patient recently admitted the diagnosis of G.P.I., suggesting that she gets herself examined? Should I do this even if she is not under my medical care?

A.—The test of the legality of an action is not whether it is specifically permitted by law but whether it is forbidden, or whether an action can be founded on it. In the present case there are two possibilities. (1) The doctor may be breaking a duty of secrecy; (2) he may be committing an actionable defamation. The duty of secrecy at law, apart from medical ethics, is not clearly laid down, and much doubt is felt whether it exists. Even if it does, it may surely be overridden by the need to protect the wife's health. Secondly, although to state of a man, either orally or in writing, that he is suffering from G.P.I. is doubtless defamatory, and gives right of action, the action would fail if the doctor showed that his statement was true, or that it was made reasonably and in good faith to protect the wife's health.

Safe Milk for Children

Q.—At what age would you allow a child to take unboiled milk? One may bring up a baby and infant on boiled or pasteurized milk, but obviously one cannot continue in modern society doing so indefinitely.

A.—The short answer is that a child should have boiled milk until he is about 2 years of age and thereafter milk that has been efficiently pasteurized. It is surely easier to do this in "modern society" than in the last century—for example, since much more milk is now pasteurized. Moreover, legislation has been passed to make it compulsory, as soon as plant and personnel are available, for all milk to be pasteurized except from T.T. and "accredited" cows. When this becomes the practice all over the country the risks of liquid milk—not only for children—will be avoidable. Meanwhile, all milk for children should preferably be heat-treated. What the questioner is worried about probably is what happens when the child goes out to tea, or on holiday, or to a restaurant, or has milk at school. Procedure recommended in these situations is as follows: Tea parties, child take his own milk; holidays, especially if on a farm, milk to be boiled (a useful excuse is that it is too rich); at a restaurant—in London and large cities it will probably be pasteurized milk anyway, and if there is any doubt about it ask for it to be boiled or give the child something else; at school, inquire if the milk is pasteurized, and, if not, arrange for the child to have it boiled or as cocoa.

Acute Aspirin Poisoning

Q.—Would you please state the symptoms of acute aspirin poisoning? Is there any evidence to prove it is a cumulative drug?

A.—The symptoms of acute aspirin poisoning are those of salicylism. Deafness and headache occur first, and if the drug is continued or larger doses are given the patient suffers from vomiting, unconsciousness, delirium, dyspnoea, and deepened respiration. The pulse weakens and becomes irregular, epistaxis is common, and haemorrhage may occur from other parts of the body, such as haematuria and retinal haemorrhage. Idiosyncratic reactions may occur such as urticaria, erythema, or purpura. About 10% of asthmatics are aspirin-sensitive and develop violent paroxysms of asthma after taking the drug. A local gastric reaction may give rise to haematemesis. Aspirin is not cumulative in the ordinary sense—i.e., the drug itself does not accumulate in the body—but it may produce a cumulative effect by its action on the prothrombin of the plasma. Salicylic acid is related to the anticoagulant substance dicoumarol, and it is possible that continued dosage with aspirin might lower the prothrombin level to a haemorrhagic level.

Orchitis without Parotid Enlargement

Q.—In a recent mumps epidemic in my unit (about 50 cases) I saw two cases of orchitis without any history of parotid enlargement, fever, sore throat, etc. Is this to be expected, or is it very unusual?

A.—The mumps virus has particular affinity for certain tissues, which include the meninges, salivary glands, pancreas, testicle, and ovary. Normally the susceptibility of the salivary glands is much higher than testicular tissue; hence the virus tends to settle there first; but this is not invariably the sequence. Thus (*a*) orchitis preceding salivary gland involvement and (*b*) orchitis as the only manifestation of mumps have been encountered in the past. Both are uncommon. The factors which favour occasional resistance of all the salivary glands are unknown, but testicular susceptibility appears to bear a fairly close relation to sexual activity.

Prolactin

Q.—Is there a lactogenic hormone which can be administered at parturition to stimulate the milk yield of the breasts in an otherwise normal woman of 35 years? Do the results justify the use of such a preparation?

A.—There is a lactogenic hormone, usually called prolactin, secreted by the anterior lobe of the pituitary, and it is in large measure responsible for the initiation of lactation after parturition. It is available for clinical use and is administered by intramuscular injection. To stimulate lactation, treatment should be begun within a few hours after delivery rather than during labour, and a total of at least 1,000 i.u. should be given in divided doses during the first forty-eight to seventy-two hours—say, five injections of 200 i.u. each. The effect of such treatment is extremely variable and is, in any case, difficult to assess. There is good reason to question whether it is worth while, particularly as local reactions to the injections are not uncommon. However, the time is not ripe for a definite conclusion as to its merits, and meanwhile it is a treatment worthy of trial in special cases.

Nausea in Carcinoma of Stomach

Q.—I am suffering from an advanced degree of cirrhous carcinoma of the stomach. My latest symptoms have been constant feeling of nausea with bouts of violent retching, with no result except frothy mucous. I have to take morphine occasionally, and this makes it worse. Can you suggest anything for my relief?

A.—Morphine is rather apt to provoke vomiting, even in normal people. To prevent this it may be combined with atropine gr. 1/100, or dilaudid may be substituted, or opium by mouth. Wartime experiments on air-sickness and sea-sickness suggest that the two most effective remedies against nausea are barbiturates and hyoscine. Barbiturates usually have to be pushed to a sufficient degree to produce sleepiness, but hyoscine hydrobromide gr. 1/100 by mouth may relieve nausea and allow normal activity. It may be repeated two or three times daily. Lavage with a dilute solution of sodium bicarbonate, a teaspoonful to the pint, is the classical remedy for nausea and vomiting in carcinoma of the stomach; with practice it is not distressing and may be repeated two or three times daily. Injection of vitamin B_1 has been favourably mentioned, and older-fashioned remedies are tincture of nux vomica, 5 to 15 minims before meals, or a few drops of chloroform on a lump of sugar. Alvarez states that some women are able to relieve menstrual nausea by overbreathing till they become dizzy.

Sterilizing Paraldehyde

Q.—In order to avoid any risk of injecting claustridia spores when giving intramuscular injections, how should paraldehyde be sterilized to avoid decomposition by oxidization?

A.—The only method of ensuring the sterility of fluids which cannot be autoclaved is by filtration. Whether this is necessary is another question. We know of no evidence bearing on the possible bacterial contamination of paraldehyde, and of no record of an infection produced by injecting it; this, however, may only be because the practice is uncommon.

Haemoglobin and Plasma Protein Estimation

Q.—Major-Gen. Ogilvie, in his article on May 5, speaks of bedside methods of estimating haemoglobin and plasma protein which have only been available within the last two years (paragraph on general health of the injured, p. 620). To what method does he refer?

A.—The new methods referred to are those based on the determination of the specific gravity of whole blood and plasma by the copper sulphate method. This is based on the facts that plasma or whole blood dropped into a solution of copper sulphate of known gravity is encased in a sack of copper proteinate, and the gravity of this discrete drop is not changed for about 15 seconds. The rise or fall of the drop during this interval shows whether it is lighter or heavier than the solution. Copper sulphate solutions of known gravity are made with precision by diluting a stock solution, which is prepared either from weighed amounts of crystalline copper sulphate or from measured volumes of saturated copper sulphate solution. Standard copper sulphate solutions with gravities graded at 0.001 intervals suffice to measure the gravity of blood or plasma to $\pm$ 0.002. Three or four drops of blood or plasma and about a minute of time suffice for a determination. No temperature controls are needed. Line charts have been prepared for quick calcula-

tion of plasma proteins from plasma gravities, and of haemoglobin and haematocrit values from combined plasma and whole blood gravities. The haemoglobin values thus estimated appear, from comparison with precise oxygen capacity determinations, to be as accurate as haemoglobin values determinable by the better types of colorimetric procedures. The haematocrit values are less accurate, but are useful unless blood conditions are present which alter the specific gravity of the cells. If the blood cells are normal, cell counts also can be estimated from blood and plasma gravities. The technique is described in great detail in a paper from the Rockefeller Institute for Medical Research by R. A. Phillips, D. D. van Slyke, V. P. Dole, K. Emerson jun., P. B. Hamilton, and R. M. Archibald. Copies of the paper may be obtained from the Josiah Macy Jun. Foundation, 565, Park Avenue, New York 21, N.Y., U.S.A.

Care of Artificial Eye Socket

Q.—*What is the proper procedure for the day-to-day care of the socket in which an artificial eye is worn? Is it usual for there to be some redness and discharge in hot or smoky atmospheres? And, if not, what should be the treatment?*

A.—The amount of care required by an artificial eye depends upon the accuracy of the fitting. The better the fit the less trouble the eye will give. The eye should be taken out at night and the socket washed out with lotio acid. bor. night and morning. If there is a discharge, zinc sulphate gr. 1/4 should be added to the ounce of lotion. Any tendency of the lids to stick together in the morning should be combated by the application of clean vaseline to the roots of the lashes last thing at night. If the surface or edge of the eye should become rough, it should be repolished or a new one obtained.

Local Sulphonamide Therapy

Q.—*What is the present view on local sulphonamide therapy? Is it contraindicated in all cases because of the danger of a patient developing hypersensitivity, or are some of the series worse, and/or some local conditions more prone to develop these? How would you desensitize a case?*

A.—Sensitization to sulphonamides has been observed chiefly after the powdering of wounds. Whether the amount used or nature of the lesion treated determines this effect is not clear. It seems probable that sensitization in these cases was made manifest only because so many of them were subsequently given sulphonamides by the mouth; after other forms of local use such treatment is much less likely to be given.

Whether the powder treatment of battle wounds has or has not been of value is one of the largest unanswered questions facing the medical historian of the war. The original evidence in favour of its use as a prophylactic in compound fractures in civilian practice appeared sound. For the more specific purposes of treating impetigo, a localized peritonitis, or an infected granulating area requiring a skin graft, local sulphonamide treatment is undoubtedly valuable. Penicillin will do most of these things even better, and is hence likely to supersede the sulphonamides in local treatment when supplies permit.

I know of no method of de-sensitization. (See also reply to a question published on Oct. 23, 1943, p. 533.)

INCOME TAX

Retirement from Partnership

"X. Y." ceased to be a member of a partnership as from March 1, 1945. He asks, "Am I liable to any income tax on the receipts for the last year?"

*** He is not liable to income tax on the source of income after March 1, 1945. The assessment for 1944–5 (presumably made on the basis of the earnings of the firm for 1943) covers the liability of all members of the partnership up to April 5, 1945. "X. Y." should therefore bear only tax on 11/12ths of his share of the 1944–5 assessment, and is not liable for any part of the tax to be assessed for 1945–6 on the basis of the earnings for 1945.

Purchase of Share of Book Debts

"BEE" bought a share in a partnership, paying £200 for a share of the book debts. Can he claim any deduction for this payment, seeing that he has to pay tax on his share of debts recovered by the firm?

*** No. The firm is presumably assessed on the basis of cash receipts, otherwise the point would not arise. The tax which "Bee" pays does not relate in fact to the debts he purchased; they may be included in calculating the profit for tax purposes, but the tax is paid for the year of assessment. If and when "Bee" sells his share of the partnership debts, he will not be liable to account for tax on the amount received—that will be a receipt of capital, just as the £200 is a payment of capital.

LETTERS, NOTES, ETC.

Health Education Lectures

DR. ROBERT SUTHERLAND, medical adviser and secretary, Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1, writes: I should be grateful if you would let your readers know that this council has now a balanced team of technical officers whose services are available to local authorities, educational institutions, and voluntary organizations for help in their health education work. This team consists of medical men and women with specialized experience in different health fields, two biologist-educationists and an educational psychologist. Between them these officers are competent to cover most aspects of health and health education. Any of your readers who feel that they could make use of the services of these lecturers in any health education they may be carrying out can get further information from me.

Antiscorpion Serum

ALLEN AND HANBURYS LTD. write: In the *Journal* of April 1 (6. 618) Dr. Frank Marsh mentions that an antiscorpion serum was made before the war. We should like to point out that the Lister Institute makes a concentrated multivalent antiscorpion serum which we issue. This serum is obtained from horses that have been immunized against the venoms of the scorpions *Buthus quinquestriatus, Prionurus citrinus,* and *Buthus maurus.* The dose is the contents of one phial.

Clinical Photography

DR. FRANK R. NEUBERT (London, S.W.15) writes: The medical profession has given surprisingly little attention to the art of clinical photography. Students are still entertained during lectures by lantern slides and epidiascope pictures which would, as often as not, disgrace the merest tyro in photography. Lecturers suffer this because they either illustrate, however badly, some rare condition about which they wish to speak, or are the only slides available. No general attempt is made to take advantage of modern photographic technique to produce pictures which would illustrate cases more clearly and add to the interest of the lesson. The same standard is accepted in illustrating textbooks, although modern works on dermatology provide exceptions, and some books on surgery owe much of their popularity to the quality of the illustrations. This state of affairs is due to the fact that, although most institutions have photographic apparatus of sorts, the men who use it are invariably laboratory assistants whose knowledge of and interest in photography are *nil*. Many doctors (whose work is shown regularly in slides and exhibitions) are expert photographers, and it is regrettable that more of their skill is not devoted to use of the clinical camera. Some diseases of which there are no good photographic records are gradually passing from our clinical ken. An opportunity exists for some firm or body interested in photography to compile a library of kinematic and static photographs, both in colour and in monochrome, from which writers and lecturers could obtain illustrations more worthy of modern medicine.

A Missing Infant

L. CLARE, divisional detective inspector, "D" Division, Metropolitan Police, Albany Street Police Station, N.W.1, asks us to state that about 4.30 p.m. on April 16 Maurice Stephen Jakubowicz, aged 8½ months, hair dark and sparse, eyes brown, well nourished, circumcised, vaccination mark on left arm, rash mark on both temples and back of head caused by eczema, top of left ear turned down, was stolen from his perambulator outside Pemberthy's, 399, Oxford Street, W. Despite numerous inquiries this child is still missing, but on the same day its clothing was found near a static water tank at the back of Selfridge's. The tanks at the rear of Selfridge's have been emptied without any further discovery. A photograph of the child appears outside every police station in the Metropolitan District, and all country forces have been given particulars and photograph. "It is thought that the child may be in need of medical attention, and therefore could you, in order to assist us, bring to the notice of your readers the fact that the child is still missing and how gladly we would receive any information. The father of the child is serving in the British Army, and is returning to the Continent shortly."

Disclaimer

DR. W. EDWARDS (Ashtead) writes: May I disclaim responsibility for the sensational article about myself which appeared in one of the Sunday papers on June 3? A reporter came during my morning surgery and produced the letter by me which appeared in last week's *B.M.J.* I understood he wished to quote it, and, as it had been published, he plainly had every right to do so, whether I objected or not. After leaving me he went on to the factory mentioned, where he obtained the story he actually wrote; but I knew nothing about this until it appeared in print.

Correction

We must apologize for a slip in the preparation of Dr. Pallister's letter for press (May 19, p. 714). His reference was to *Mrs.* Isabel Wilde.